# SAF-RC-048 100 Area and 300 Area Component of the RCBRA Water Sampling FINAL VALIDATION PACKAGE

#### COMPLETE COPY OF VALIDATION PACKAGE TO:

Jill Thomson

H0-23

MAP 1-19-06

Jeanette Duncan

H9-02

MJP 1-19-06

#### **COMMENTS:**

SDG(K0046)

SAF-RC-048

Sample Location/Waste Site:

J107Y9

199-H4-5

J10891

199-F5-6



Date:

3 January 2005

To:

Washington Closure Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

100 Area and 300 Area Component of the RCBRA Water Sampling

Subject: Radiochemistry - Data Package No. K0046-EB

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

A Sample Advisor	n Sampladencia	M. paulyledia	Ne Valle allen et	a grand of the same
J10891	10/13/05	Water	С	See note 1
J107Y9	10/13/05	Water	С	See note 1

<sup>1 -</sup> Tritium, radium-226, radium-228, total strontium, isotopic thorium, isotopic uranium, gamma spectroscopy.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005).

Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Data Requested by Client

#### DATA QUALITY PARAMETERS

#### Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

#### · Preparation (Method) Blanks

#### Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

#### Field (Equipment) Blank

No field blanks were submitted for analysis.

#### Accuracy

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 80-120%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

#### Laboratory Duplicates

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

#### Field Duplicates

No field duplicates were submitted for analysis.

#### Detection Levels

Reported analytical detection levels for undetected analytes are compared against the 100 & 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. One analyte exceeded the RQL. Under the WCH statement of work, no qualification is required.

#### · Completeness

Data package No. K0046 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### MAJOR DEFICIENCIES

None found.

#### MINOR DEFICIENCIES

Due to the lack of an LCS analysis, all thorium-228 and thorium-232 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

One analyte exceeded the RQL. Under the WCH statement of work, no qualification is required.

#### **REFERENCES**

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, 100 Area and 300 Area Component of the RCBRA Water Sampling Plan.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

**Summary of Data Qualification** 

#### RADIOCHEMISTRY DATA QUALIFICATION SUMMARY\*

TANG THE REPORT OF THE PROPERTY OF THE PROPERT	$\begin{aligned} & \mathbf{Y} \in \mathbf{P}(\mathbf{x}) \\ & \mathbf{Y} = \begin{bmatrix} -1 & \mathbf{G} \cdot \mathbf{Y} \\ \mathbf{Y} = \mathbf{G} \\ \mathbf{Y} \end{bmatrix} \\ & \mathbf{Y} = \begin{bmatrix} -1 & \mathbf{G} \cdot \mathbf{Y} \\ \mathbf{Y} \end{bmatrix} \\ & \mathbf{Y} = \begin{bmatrix} -1 & \mathbf{G} \cdot \mathbf{Y} \\ \mathbf{Y} \end{bmatrix} \end{aligned}$	inite de la companya	
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228 Thorium-232	J	All	No LCS analysis

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTO					
Laboratory: EB					
Case	SDG:	H3203			
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Radiochemistry	RQL	Result	Q	Result	Q
Tritium	400	1970		2900	<u> </u>
Total Strontium	1	7.27		-0.176	
Radium-228	3	1.53	U	-0.185	U
Thorium-228	<u> </u>	-0.024	UJ	0.066	IJ
Thorium-230		0	U	0.065	U
Thorium-232	1	0	IJ	0	UJ
Uranium-233/234	1	3.48		2.51	
Uranium-235	1	0.254		0.185	U
Uranium-238	1	3.54	<u> </u>	1.35	
Radium-226	1	0.916	L	0.818	υ
Potassium-40		U	U	υ	υ
Cobalt 60	25	U	U	U	U
Cesium 137	15	U	V	U	U*
Radium-226		υ	Ų	U	U
Radium-228		υ	U	U	υ
Europium 152		U	_	U	U
Europium 154	L	U	U	U	U
Europium 155	_	U		<u> </u>	U
Thorium-228	<u> </u>	U	_	U	U
Thorium-232		U	<u> </u>	U	U
Uranium-235(gea)		U	_	U	U
Uranium-238(gea)		U	_	U	-
Americium-241(gea)	ļ	U	<del>-</del>	U	U
Ruthenium-106	<u> </u>	U	-	U	U
Antimony-125		U	<u> </u>	U	
Beryllium-7	↓	U		U	υ
Ceslum-134	I	U	lυ	υ -	lυ

#### EBERLINE SERVICES/RICHMOND SAMPLE DELIVERY GROUP K0046

7318-002

#### DATA SHEET

J10891

l.	7318 Melissa C. Mannion	Client/Case no Contract	·	SDG_K0046
Lab sample id Dept sample id Received		Client sample id Location/Matrix Collected/Volume Custody/SAF No	199-F5-6 10/13/05 11:11	7.0 L RC-048

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Tritium	10028-17-8	1970	150	170	400	<del> </del>	н
Total Strontium	SR-RAD	7.27	0.83	0.63	2.0		SR
Radium 228	15262-20-1	1.53	1.0	1.8	3.0	Ü	AC
Thorium 228	14274-82-9	-0.024	0.048	0.18		υŢ	TH
Thorium 230	14269-63-7	0	0.095	0.18	1.0	ຫຼື	TH
Thorium 232	TH-232	0	0.047	0.18	1.0	υJ	TH
Uranium 233/234	U-233/234	3.48	0.68	0.20	1.0		υ
Uranium 235	15117-96-1	0.254	0.19	0.24	1.0		Ū
Uranium 238	U-238	3.54	0.69	0.20	1.0		υ
Radium 226	13982-63-3	0.916	0.95	1.5	2.0	บ	RA
Potassium 40	13966-00-2	U		110		ช	GAM
Cobalt 60	10198-40-0	U		9.2	25	Ū	GAM
Cesium 137	10045-97-3	U		10	15	ָ ט	GAM
Radium 226	13982-63-3	ָ ט		18		ָ ט	GAM
Radium 228	15262-20-1	ប		41		ប	GAM
Europium 152	14683-23-9	υ		30	50	ប	GAM
Europium 154	15585-10-1	U		27	50	ប	GAM
Europium 155	14391-16-3	ט		30	50	ซ	GAM
Thorium 228	14274-82-9	U.		15		ប	GAM
Thorium 232	TH-232	<b>ט</b>		41		U	GAM
Uranium 235	15117-96-1	U		45		υ	GAM
Uranium 238	U-238	Ū		1100		U	GAM
Americium 241	14596-10-2	υ		46		U	GAM
Ruthenium 106	13967-48-1	บ		79		υ	GAM
Antimony 125	14234-35-6	υ		25		ប	GAM
Beryllium 7	13966-02-4	Ū		90		UΧ	GAM
Cesium 134	13967-70-9	U		13		Ū	GAM

100Area&300AreaComponentRCBRAWaterSa

1/3/06

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/05

000011

#### EBERLINE SERVICES/RICHMOND SAMPLE DELIVERY GROUP K0046

7318-001

#### DATA SHEET

J107Y9

í	7318 Melissa C. Mannion	Client/Case no Contract		SDG_K0046
Lab sample id Dept sample id Received		Client sample id Location/Matrix Collected/Volume Custody/SAF No	199-H4-5 10/13/05 12:09	WATER 7.0 L RC-048

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Tritium	10028-17-8	2900	170	170	400		H
Total Strontium	SR-RAD	-0.176	0.30	0.65	2.0	<b>U</b> -	SR
Radium 228	15262-20-1	-0.185	0.73	2.0	3.0	υ	AC
Thorium 228	14274-82-9	0.066	0.066	0.25		UJ	TH
Thorium 230	14269-63-7	0.065	0.13	0.25	1.0	σ	TH
Thorium 232	TH-232	0	0.065	0.25	1.0	υJ	TH
Uranium 233/234	U-233/234	2.51	0.59	0.23	1.0	_	U
Uranium 235	15117-96-1	0.185	0.15	0.28	1.0	ט	ប
Uranium 238	U-238	1.35	0.44	0.23	1.0		U
Radium 226	13982-63-3	0.818	1.1	1.9	2.0	ט	RA
Potassium 40	13966-00-2	ប		290		ט	GAM
Cobalt 60	10198-40-0	บ		20	25	U	GAM
Cesium 137	10045-97-3	U		_21	15	บ	GAM
Radium 226	13982-63-3	U		33		ับ	GAM
Radium 228	15262-20-1	U		83		υ .	GAM
Europium 152	14683-23-9	Ù		_57	50	ប	GAM
Europium 154	15585-10-1	U		51	50	ប	GAM
Europium 155	14391-16-3	U		45	50	U	GAM
Thorium 228	14274-82-9	Ū		28		Ü	GAM
Thorium 232	TH-232	ט		83	•	U	GAM
Uranium 235	15117-96-1	U		63		ប	GAM
Uranium 238	U-238	ט		1900		U	GAM
Americium 241	14596-10-2	ט		61		Ü	GAM
Ruthenium 106	13967-48-1	U		140		Ū	GAM
Antimony 125	14234-35-6	ប -		40		U	GAM
Beryllium 7	13966-02-4	บ		160		UX	GAM
Cesium 134	13967-70-9	ט		23		บ	GAM

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/05

Laboratory Narrative and Chain-of-Custody Documentation

#### **Case Narrative**

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#### 1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0046 was composed of two water samples designated under SAF No. RC-048 with a Project Designation of: 100 Area and 300 Area Component of the RCBRA Water Sa.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on November 11 and 19, 2005.

#### 2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Radium-226 Analysis

No problems were encountered during the course of the analyses.

2.3 Radium-228 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.6 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.7 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

#### **Case Narrative Certification Statement**

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion Senior Program Manager 11 19 /5 Date

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Washington Closur	e Hanford	<del></del>	IAIN OF CUST			E ANAL'	<u>YSIS</u>			RO	C-048-3	Page 1	of 2
Collector L.D.W.F	<del>1</del> U		nv Contact N KESSNER	Telepho 375-4	ne No. K	0046		Proiect Coordi KESSNER, JH	nator [	Price Code	7L	Data Tur	rnaround
Project Designation 100 Area and 300 Area Comp		Samol	ng Location			318	· -	SAF No. RC-048		Air Quality		21 I	Days
Ice Chest No. AFS	-04-050	Field I	ogbook No. 1592		COA BESA	AS652	20	Method of Ship FED EX	mest				
Shipped To EBERLINE SERVICES LIC		Offsite	Property No.		3034			Bill of Lading/ SEE OSPC	Air Bill N	0.			
POSSIBLE SAMPLE HAZA	RDS/REMARKS	1			] <b>-</b>								
POTENTIAL RADIOACTIVE		٠	Preservation	None	HNO3 to pl	HNO3 to pH	HNO3 t		HNO3 to pl	HINO3 to pH	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
L DOT L	imits		T	G/P	G/P	G/P	G/I		G/P	G/P	G/P	aG	aG
Special Handling and/or S	Storage		Type of Container	1	1	2	<del>                                     </del>	2		<del></del>			
N/A			No. of Container(s)		<u> </u>				<u>'</u>	1	1	3	2 .
0			Volume	125mL	1000miL	1000mL	1000	rnL 1000mL	1000mL	500mL	500mL	1000mL	1 000mL
000015	SAMPLE ANALY	YSIS	Apress	Carbon 14; Tritium - H3	See item (1) Special Instructions	89,90 Total	Isoto Thorian (Thorian	um Urmanum	Radium -228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082
													<u> </u>
Sample No.	Matrix *	Sample Date	Sample Time										
J107Y9	WATER	10/13/05	1209	X	<u>  X</u>	X	X	X	X		<u></u>	İ	<u> </u>
,	·				-			_   _	İ		-		
		<u> </u>											
CHAIN OF POSSESSIO	ON /	Sign/Print	Names		SPE	CIAL INSTI	RUCTIO	ONS	<u> </u>				Matrix *
Relinquished By/Removed From C. S. C. S. C. S. C. Relinquished By/Removed From	Dot Date/Time   10/13/05/1286   Date/Time   Date/Time   Date/Time   0   4   6 5	Received By/Stor	od in Da	ite/Time	Cok Ura (2) Cad Mo	oalt-60, Europium nium-235, Urani ICP Metals - 60 Imium, Calcium, lybdemum, Nicke	n-152, Ea ium-238) 10 (Full l Chromiu el, Phosph	(Americium-241, Americium-241, Americium-154, Europi List) (Aluininum, Am Int, Cobalt, Copper, Incrus, Potassium, Se Ic): Mercury - 7470	um-155, Pot ntimony, Ars Iron, Lead, I lenium, Silic	assium-40, Ruth enic, Barium, Be åthium, Magnesi	enium-106, The ryllium, Bismu um, Manganes	orium-234, th, Boron, e,	S=Soil SE=Scriment SO=Solid SI=Sludge: W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids
Relinquished By/Removed From	Dute/Time	Received By/Stor	<del>/</del>	te/Time	1100	, Степішіі, Таўа	wwi, Cil	w, mercuty - 1470					T=Tissue W=Wipc L=Liquid V=Veget=ion
Relinquished By/Removed From	Date/Time	Received By/Stor	Cu III	ite/Time									X=Other
Relinquished By/Removed From	Date/Time	Received By/Stor	ed In Da	ite/Time									
LABORATORY Received B	у			τ	itle			•			Γ	Pate/Time	
FINAL SAMPLE Disposal M DISPOSITION	ethod			,	<u> </u>	Dispo	sed By				1	Date/Time	

Collector DURATEK LO. WALL  COMBANY Consider Telephone No. 275-4688  Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa 100 Area and 300 Area Component of the RCBRA Water Sa 100 Area and 300 Area Component of the RCBRA Water Sa 100 Area and 300 Area Component of the RCBRA Water Sa 100 Area and 300 Area Component of the RCBRA Water Sa 100 Area and 300 Area Component of the RCBRA Water Sa 100 Area Component Sa	Washington C	losure Hanford	CI	HAIN OF CUST	ODY/S	AMPLE	ANALY	YSIS	REQUEST	,	RC	C-048-6	Page 1	of <u>2</u>
The Chest No.   A F S - 0 4 - 0 5   Field Leables No.   Eld   192   Field Leables No.   Eld   1932   Field Leables No.   Eld   193			Compa	iny Contact	Telepho	ne No.			Project Coordin	antor	rice Code	7L	Data Tur	naround
Shipped   Services   LONVILLE   Cold AC   Co	Project Designation 100 Area and 300 Area	a Component of the RCBRA Wa			Koo	744 C	73/8)			A	ir Quality		21 I	)ays
Shipped   Services   LONVILLE   Cold AC   Co	Ice Chest No.	FS-04-050	L L	_		BESRI	45652	20	1	ment				
POSSIELS SAMPLE PLAZARDS/REMARKS   Preservation   None   18000 to pit   18000 t	Shipped To EBERLINE SERVICE	ES LIONVILLE	Offsit	e Property No.						Air Bill No	).			
Preservation Type of Container	POSSIBLE SAMPLE	HAZARDS/REMARKS				1 -			<u> </u>			<u> </u>		
Special Handling and/or Storage  No. of Container(s)  Volume  125ml. 1000ml. 1				Preservation	<u> </u>	< 2	Q						Cool 4C	Coot 4C
No. of Container(s)  Velome  125ml. 1000ml. 1000ml. 1000ml. 500ml. 500ml. 500ml. 1000ml. 1000ml. 500ml. 500ml. 1000ml. 1000ml. 1000ml. 500ml. 1000ml. 1000ml. 1000ml. 1000ml. 500ml. 1000ml. 1	i	_		Type of Container	G/P	G/P	G/P	G/I	P G/P	G/P	G/P	G/P	aG	aG
SAMPLE ANALYSIS    Sample No.   Matrix *   Sample Date   Sample Time   Section   Sample Time   Sampl	1	ithet pretage		No. of Container(s)	1	1	2	1	2	1	1	1	3	2
Sample No. Matrix * Sample Date Sample Time  J10891 WATER 10/13/QS 1111 X X X X X X X X X X X X X X X X X		-		Volume	125mL	1000mL	1000mL	1000	mL 1000mL	1000mL	500mL	500mL	1000mL	1000mL
CHAIN OF POSSESSION   Sign/Print Names   Date/Time   [25]   Received By/Stored In   Date/Time   Date	00016	SAMPLE ANAL	YSIS	, 14 10,705	Corbon 14, Trikinan - H3	Special	89,90 Total	Thori	um Uraniam n-232) (Uraniam- 233/234, Uraniam-235,		Special			PCBs - 8082
CHAIN OF POSSESSION   Sign/Print Names   Date/Time   [25]   Received By/Stored In   Date/Time   Date	Sample No.	Matrix *	Sample Date	Sample Time				( / / · · · ·						
CHAIN OF POSSESSION  Sign/Print Names  Relinquished By/Removed from Labor Time    Cobal-Copium-15, Descrim-13, Cobal-Copium-15, Beryllium-7, Cesium-134, Cesium-134, Cesium-134, Cesium-134, Cesium-134, Cesium-137, Cobal-Cobal-Copium-15, Beryllium-7, Cesium-134, Cesium-134, Cesium-134, Cesium-134, Cesium-134, Cesium-137, Cobal-Cobal-Copium-15, Beryllium-16, Thorium-234, International Cobal-Copium-15, Beryllium-16, Thorium-234, International Cobal-Copium-15, Beryllium-18, Bery	J10891	WATER		<del></del>	X		X	X Same		Y			المتعادي المتعدد أد	
Relinquished By/Removed From Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Ti			10/12/0-		<del>                                     </del>	1-2	<del>  ^</del>	<del>                                     </del>	`	<del>  ^</del>	-	+	<del></del>	<del> </del>
Relinquished By/Removed From Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Ti				<del></del>	<del>                                     </del>		<del>                                     </del>	1	<del></del>	<del> </del>	-	<del> </del>	<del> </del>	<u> </u>
Relinquished By/Removed From Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   125   Received By/Stored In   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Time   Received By/Stored In   Date/Time   Date/Ti			······		<del> </del>			<del> </del>		<del>                                     </del>		+		
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Relinquished By/Removed From Date/Time Received By/Stored In Date/Time  Relinquished By/Removed From Date/Time Received By/Stored In Date/Time  LABORATORY SECTION  Received By  Title  Date/Time  Date/Time  Date/Time  Date/Time	Relinquished By/Removed Relinquished By/Removed	From (12) Date/Time    10   3   5   3   3	Received By/St Received By/St	ored in 10 14 05	ate/Time	(25 (1) Cob Ura: (2) Cad	Gamma Spec - alt-60, Europiu nium-235, Uran ICP Metals - 60 mium, Calcium, ybdenum, Nick	(Full List m-152, E ium-238 iu	t) {Americium-241, aropium-154, Europ } List) {Aluminum, A um, Cobalt, Copper, shorus, Potassium, Se	ium-155, Pot ntimony, Ars Iron, Lead, L elenium, Silic	assium-40, Ruth enic, Barium, B ithium, Magnes	enium-106, Th eryllium, Bism ium, Mangane:	orium-234, ath, Boron, se,	SE-Sediment SO-Solid SY-Shedge W = Water O-Oil A=Air DS=Drum Solids DL=Drum Liquidt T=Tissue W1=Wipe
LABORATORY SECTION  Received By  Title  Date/Time  FINAL SAMPLE  Disposal Method  Disposal Method  Disposal Method	Relinquished By/Removed	From Date/Time	Received By/St	ored In C	ate/Time					•				V=Vegetation
SECTION  FINAL SAMPLE Disposal Method  Disposed By  Date/Time	Relinquished By/Removed	From Date/Time	Received By/St	ored In C	Pate/Time									
FINAL SAMPLE Disposal Method Disposal Method Disposed By	Danoierron	eceived By		· · · · · · · · · · · · · · · · · · ·		Title	<u> </u>			<del></del>	<u>-</u>	<del></del> -	Date/Time	<del></del>
	FINAL SAMPLE D	isposal Method				- · · · -	Disp	osed By	·				Date/Time	

**Data Validation Supporting Documentation** 

# APPENDIX A RADIOCHEMICAL DATA VALIDATION CHECKLIST

	f	LAB: Er	DATA PACKAC	E: Koc	146
Gross Alpha/Beta Strontiu Total Uranium Radium		LAB: E			
Total Uranium Radium		1 2		DATE: /2//	/c/eS
Total Uranium Radium		ANALYSES	SDG: K	3400	
	22 2 + 22 6')	Technetium-99	Tipha Spectroscopy	Gamma Spectroscomy	
SAMPLES/MATRIX		·			
710891	J107	<u> </u>	<del></del>		
				<u>.</u>	
	·				
					Swater
1. Completeness					🗆 N/A
1. Completeness					$\bigcirc$
Technical verification	forms pr	esent?		Ye	No N/A
Comments:					
		·			25
2. Initial Calibration	(Levels D	o, E)			
Instruments/detectors	calibrate	d?			\ Yes No N/A
Initial calibration acco					
Standards NIST trace					'
Standards Expired?					
Calculation check acc					
Comments:					

3. Continuing Calibration (Levels D, E)	N/A
Calibration checked within required frequency?	Yes No N/A
Calibration check acceptable?	Yes No N/A
Calibration check standards traceable?	Yes No N/A
Calibration check standards expired?	Yes No N/A
Calculation check acceptable?	Yes No N/A
Comments:	
4. Background Counts (Levels D, E)	<b>X</b> N/A
Background Counts checked within required frequency?	$I_{ij}$
Background Counts acceptable?	Yes No N/A
Calculation check acceptable?	Yes No N/A
Comments:	·
	· · · · · · · · · · · · · · · · · · ·
	<u> </u>

5. Blanks (Levels B, C, D, E)
Method blank analyzed within required frequency?Yes No N/A
Method blank results acceptable?
Analytes detected in method blank?
Field blank(s) analyzed? Yes No N/A
Field blank results acceptable?
Analytes detected in field blank(s)?Yes No N/
Transcription/Calculation Errors? (Levels D, E)
Comments: No FR
6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E)
LCS /BSS analyzed within required frequency?
LCS/BSS recoveries acceptable?
LCS/BSS traceable? (Levels D,E)
LCS/BSS expired? (Levels D,E)
LCS/BSS levels correct? (Levels D,E)
Transcription/Calculation Errors? (Levels D, E)
Comments: NO th-228 or 237 Les - Tell
Commence. 1.0 XXX
7. Chemical Carrier Recovery (Levels C, D, E)
Chemical carrier added?
Chemical recovery acceptable?Yes No N/A
Chemical carrier traceable? (Levels D, E)

Chemical carrier expired? (Levels D, E)	Yes No N/A
Transcription/Calculation errors? (Levels D, E)	Yes No N/A
Comments:	
8. Tracer Recovery (Levels C, D, E)	🗆 N/A
Tracer added?	Ye No N/A
Tracer recovery acceptable?	)\\\
Tracer traceable? (Levels D, E)	
Tracer expired? (Levels D, E)	
Transcription/Calculation errors? (Levels D, E)	~
Comments:	$\bigcirc$
9. Matrix Spikes (Levels C, D, E)	🗆 N/A
Matrix spike analyzed?	Xes No N/A
Spike recoveries acceptable?	
Spike source traceable? (Levels D, E)	
Spike source expired? Levels D, E)	XC_XX
Transcription/Calculation Errors? (Levels D, E)	
Comments:	$\mathcal{O}$

10. Duplicates (Levels C, D, E)	□ N/A
Duplicates Analyzed at required frequency?	
RPD Values Acceptable?	
Transcription/Calculation Errors? (Levels D, E)  Comments:	Yes No (N/)
11. Field QC Samples (Levels C, D E)	N/A
Field duplicate sample(s) analyzed?	Yes No N/A
Field duplicate RPD values acceptable?	
Field split sample(s) analyzed?	
Field split RPD values acceptable?	
Performance audit sample(s) analyzed?	
Performance audit sample results acceptable?	
Comments:	
12. Holding Times (All levels)	
Are sample holding times acceptable?	Yes No N/A
Comments:	<b>t</b> 1

13. Results and Detection Limits (All Levels)	
Results reported for all required sample analyses?	
Results supported in raw data?(Levels D, E)	Yes No (N/A)
Results Acceptable? (Levels D, E)	Yes No(N/A)
Results supported in raw data?(Levels D, E)	Yes No N/A
MDA's meet required detection limits?	Yes No N/A
Transcription/calculation errors? (Levels D, E)	Yes No N/A)
Comments:	

Additional Documentation Requested by Client

#### EBERLINE SERVICES/RICHMOND SAMPLE DELIVERY GROUP KOO46

7318-004

#### METHOD BLANK

Method Blank

	7318 Melissa C. Mannion	Client/Case no Contract	 SDG_K0046
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No	 WATER

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	
Tritium	10028-17-8	-185	980	980 <u>1700</u>		Ū	н	
Total Strontium	SR-RAD	-0.170	0.32	0.71	2.0	U	SR	
Radium 228	15262-20-1	-0.090	0.65	1.7	3.0	υ.	AC	
Thorium 228	14274-82-9	0.022	0.044	0.17		ช	TH	
Thorium 230	14269-63-7	-0.022	0.088	0.17	1.0	U	TH	
Thorium 232	TH-232	0	0.044	0.17	1.0	U	TH	
Uranium 233/234	U-233/234	0.033	0.066	0.25	1.0	U	U	
Uranium 235	15117-96-1	0	0.080	0.31	1.0	U	υ	
Uranium 238	U-238	0	0.066	0.25	1.0	U	ซ	
Radium 226	13982-63-3	0.376	0.99	1.8	2.0	U	RA	
Potassium 40	13966-00-2	U	•	170		. n	GAM	
Cobalt 60	10198-40-0	U		19	25	U	GAM	
Cesium 137	10045-97-3	U.		14	15	υ	GAM	
Radium 226	13982-63-3	U	-	27		U .	GAM	
Radium 228	15262-20-1	U ·		66		ַ ט	GAM	
Europium 152	14683-23-9	บ		37	50	U	GAM	
Europium 154	15585-10-1	U		48	50	U	GAM	
Europium 155	14391-16-3	U		26	50	υ	GAM	
Thorium 228	14274-82-9	U		18		Ü	GAM	
Thorium 232	TH-232	U		66		U	GAM	
Uranium 235	15117-96-1	U	-	47		Ü	GAM	
Uranium 238	บ-238	U		1900		U	GAM	
Americium 241	14596-10-2	U		15		U	GAM	
Ruthenium 106	13967-48-1	ט		120		ָ <b>ט</b> ַ	GAM	
Antimony 125	14234-35-6	บ	-	34		ប	GAM	
Beryllium 7	13966-02-4	ט		110		UΧ	GAM	
Cesium 134	13967-70-9	υ		19		ט	GAM	

100Area&300AreaComponentRCBRAWaterSa

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/05

#### EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-003

#### LAB CONTROL SAMPLE

Lab Control Sample

SDG <u>7318</u>	Client/Case no Hanford SDG K0046
Contact Melissa C. Mannion	Contract No. 630
Lab sample id <u>R510084-03</u>	Client sample id Lab Control Sample
Dept sample id 7318-003	Material/MatrixWATER
	SAF No RC-048

ANALYTE	RESULT pC1/L	2σ ERR (COUNT)	MDA pCi/L	ROL pCi/L	QUALI- FIERS	TEST	PCi/L	2σ ERR pCi/L	REC	3σ IMTS (TOTAL)	PROTOCO LIMITS
Tritium	21400	1500	1600	400		н	22700	910	94	82-118	80-120
Total Strontium	21.3	1.2	0.56	2.0		SR	19.8	0.79	108	81-119	80-120
Radium 228	18.8	1.5	1.9	3.0		AC	17.4	0.70	108	84-116	80-120
Thorium 230	21.6	2.5	0.17	1.0		тн	21.0	0.84	103	80-120	80-12
Uranium 233/234	20.3	2.3	1.0	1.0		σ [	18.6	0.74	109	79-121	80-120
Uranium 235	15.7	1.9	0.27	1.0		ซ	15.1	0.60	104	79-121	B0-120
Uranium 238	19.4	2.2	0.98	1.0		ם	20.2	0.81	96	81-119	80-120
Radium 226	239	9.3	1.8	2.0	•	RA	280	11	85	90-110	80-120
Cobalt 60	413	71	47	25		GAM	444	18	93	68-132	80-12
Cesium 137	497	61	46	15		GAM	438	18	111	67-133	80-12

100Area&300AreaComponentRCBRAWaterSa

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QC-LCS 54735			

LAB CONTROL SAMPLES
Page 1

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Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date <u>11/19/05</u>

#### EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-005

#### DUPLICATE

J107¥9

SDG 7318		Client/Case no <u>H</u>	anford SDG K0046
Contact Melissa C. Mannion		Contract N	o. 630
DUPLICATE	ORIGINAL		•
Lab sample id <u>R510084-05</u>	Lab sample id <u>R510084-01</u>	Client sample id $\underline{J}$	107Y9
Dept sample id <u>7318-005</u>	Dept sample id 7318-001	Location/Matrix 1	99-H4-5 WATER
	Received 10/14/05	Collected/Volume 1	0/13/05 12:09 7.0 L
		Custody/SAF No R	C-048-3 RC-048

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD	3 o TOT	DER σ
Tritium	2980	170	170	400	-	н.	. 2900	170	170		3	25	0.3
Total Strontium	0.117	0.39	0.78	2.0	ט	SR	-0.176	0.30	0.65	ט	· -		1.2
Radium 228	0.742	0.82	2.0	3.0	Ŭ	AC	-0.185	0.73	2.0	υ			1.7
Thorium 228	0	0.074	0.28		U	TH	0.066	0.066	0.25	ט	_		1.3
Thorium 230	-0.037	0.074	0.28	1.0	U	TH	0.065	0.13	0.25	ט	-		1.4
Thorium 232	0	0.074	0.28	1.0	υ΄	TH	0	0.065	0.25	บ	_		0
Uranium 233/234	2.17	0.56	0.22	1.0		ט	2.51	0.59	0.23		15	53	0.8
Uranium 235	0.142	0.14	0.27	1.0	U	ט	0.185	0.15	0.28	<b>U</b> .	-		0.4
Uranium 238	1.61	0.43	0.22	1.0		ס	1.35	0.44	0.23		18	63	0.8
Radium 226	-0.357	0.95	1.9	2.0	Ū	RA.	0.818	1.1	1.9	บ	_		1.6
Potassium 40	ש	,	170		Ü	GAM	U	•	290	ט	-		0.7
Cobalt 60	υ		17	25	σ	GAM	Ū		20	Ü	_		0.2
Cesium 137	υ		14	15	U	GAM	ט		21	Ū	-		0.5
Radium 226	U		25		ָ ָ ָ ָ	GAM	Ü		33	U	_		0.4
Radium 228	υ	•	59		ט	GAM	Ü		83	Ü	-		0.5
Europium 152	υ		34	50	ט	GAM	υ		57	Ū	•		0.7
Europium 154	ט		43	50	U	GAM	U		51	U	_		0.2
Europium 155	ס		24	50	U	GAM	σ.		45	υ.	_		0.8
Thorium 228	σ	,	16		υ	GAM	ט		28	ប	•		0.7
Thorium 232	· ט		59		ט	GAM	U		83	U	_		0.5
Uranium 235	- <b>u</b>		41		ซ	GAM	U		63	Ū	-		0.6
Uranium 238	σ		1800		υ	GAM	. 0		1900	U	-		0.1
Americium 241	ט		14		ប	GAM	ប		61	ט	_		1.5
Ruthenium 106	ט		130		Ü	GAM	ט		140	U	. <u>-</u>		0.1
Antimony 125	ט		31		U	GAM	บ		40	ซ	_		0.4
Beryllium 7	ט		120		UΧ	GAM	. ប		160	UX	-		0.4
Cesium 134	υ		18		U	GAM	υ		23	ט	_		0.3

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Form DVD-DUP

Version 3.06

Report date 11/19/05

## EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0046

7318-006

#### MATRIX SPIKE

J10891

SDG 7	7318			Client/Case no	Hanford	SDG K0046
Contact M	Melissa C. Mannion			Contract	No. 630	_
M	MATRIX SPIKE		ORIGINAL			1
Lab sample id R	2510084-06 La	b sample id	R510084-02	Client sample id	J10891	
Dept sample id 7	7318-006 Der	t sample id	7318-002	Location/Matrix	199-F5-6	WATER
	•	Received	10/14/05	Collected/Volume	10/13/05 11:11 7.	<u>0 L</u>
				Custody/SAF No	RC-048-6 RC-0	48

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pci/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)		3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	24200	520	220	400	x	н	22700	910	1970	150	98	82-118	60-140

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Version Ver 1.0

Form DVD-MS

Version 3.06

Report date <u>11/19/05</u>

Date:

3 January 2005

To:

Washington Closure Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

100 Area and 300 Area Component of the RCBRA Water Sampling

Subject: Inorganics - Data Package No. K0046-LLI

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	e#Sample#Liate#	HAMOUNG FAIRE NATE	W.Visi Valentijora) 🖘	pater Dater
J10891	10/13/05	Water	C	See note 1
J107Y9	10/13/05	Water	С	See note 1

<sup>1 -</sup> ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

#### DATA QUALITY PARAMETERS

#### Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

#### Preparation (Method) Blanks

#### Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed 000001

through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the lithium and zinc results in sample J10891 were qualified as an estimate and flagged "UJ".

Due to method blank contamination, the manganese result in sample J107Y9 was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

# Field (Equipment) Blank

No field blanks were submitted for analysis.

#### Accuracy

### Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 79% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 120% or less than 80% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

#### · Precision

#### Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (22%), all phosphorous results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

#### Field Duplicate

No field duplicates were submitted for analysis.

#### Analytical Detection Levels

Reported analytical detection levels are compared against the 100 and 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

#### Completeness

Data package No. K0046 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### MAJOR DEFICIENCIES

None found.

#### MINOR DEFICIENCIES

Due to method blank contamination, the lithium and zinc results in sample J10891 were qualified as an estimate and flagged "UJ". Due to method blank contamination, the manganese result in sample J107Y9 was qualified as an estimate and flagged "UJ". Due to an RPD outside QC limits (22%), all phosphorous results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

#### REFERENCES

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, 100 Area and 300 Area Component of the RCBRA Water Sampling Plan.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.
   The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

## **METALS DATA QUALIFICATION SUMMARY\***

SDGaKÖQ46Va		Richer Reenage	RAGE TOP!
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Lithium Zinc	UJ	J10891	Blank contamination
Manganese	UJ	J107Y9	Blank contamination
Phosphorous	J	All	RPD

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

# Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON	CLOSUR	RE HANFOR	D	}	
Laboratory: LLI					
Sample Number	-	J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
inorganics	RQL_	Result	Q	Result	ď
Silver	10	0.80	Ü	0.80	٥
Aluminum	50	31.9	J	31.9	5
Arsenic	100	4.7	U	4.7	ט
Boron	1	48.3		44.6	
Barium	20	42.5		68.5	
Beryllium	5	0.10	U.	0.10	د
Bismuth		6.5	U	6.5	U
Calcium		78700		69300	
Cadmium	5	0.40	υ	0,40	U
Cobalt		0.70	U	0.70	U
Chromium	10	80.1		19,5	
Соррег	10	1.3	U	1.3	U
Iron	50	220		133	
Mercury	0.5	0.10	U	0.10	υ
Potassium	l	2700		5700	l
Lithium		2.6	UJ	4.9	
Magnesium		11400		12600	L
Manganese	5	9.2		1.1	IJ
Molybdenum		1.8		1.8	υ
Sodium	<u> </u>	11200		21500	
Nickel	40	1.3		2.4	
Phosphorous	<u> </u>	19.4		26.6	
Lead	50			2.9	
Antimony		3.0		3.0	_
Selenium	<u> </u>	4.3		4.3	
Silicon	<u> </u>	11300		15200	
Tin	100			5.1	
Strontium	<u> </u>	361		337	
Thallium	<u> </u>	7.3		7.3	
Uranium	3000		-	13.7	lu_
Vanadlum	25			4.2	<u></u>
Zinc	10	1,6	ÙJ	5.0	

#### INORGANICS DATA SUMMARY REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0510L496

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	PACTOR
	*************		========	EFF775		
-001	J108 <b>91</b>	Silver, Total	u 08.0	UG/L	0.80	1.0
		Aluminum, Total	31.9 u	UG/L	31.9	1.0
	•	Arsenic, Total	4.7 u	UG/L	4.7	1.0
		Boron, Total	48.3	UG/L	2.3	1.0
		Barium, Total	42.5	DG/L	0.10	1.0
		Beryllium, Total	0.10 u	DG/L	0.10	1.0
		Bismuth, Total	6.5 u	DG/L	€.5	1.0
		Calcium, Total	78700	UG/L	7.1	1.0
		Cadmium, Total	0.40 u	ng/r	0.40	o.c
		Cobalt, Total	0.70 u	UG/L	0.70	1.0
		Chromium, Total	80.1	UG/L	0.70	1.0
		Copper, Total	1.3 u	ng/r	1.3	1.0
	•	Iron, Total	220	UG/L	26.0	1.0
		Mercury, Total	0.10 u	UG/L	0.10	1.0
		Potassium, Total	2700	UG/L	340	1.0
		Lithium, Total	2.6 UJ	UG/L	0.30	1.0
		Magnesium, Total	11400	UG/L	6.5	1.0
		Manganese, Total	9.2	UG/L	0.20	1.0
		Molybdenum, Total	1.9 u	DG/L	1.B	1.0
	r'	Sodium, Total	11200	UG/L	17.4	1.0
		Nickel, Total	1.3 u	UG/L	1.3	1.0
		Phosphorus, Total	19.4 J	UG/L	8.4	1.0
		Lead, Total	2.9 u	UG/L	, 2.9	1.0
		Antimony, Total	3.0 u	UG/L	ο. ε	1.0
		Selenium, Total	4.3 u	UG/L	4.3	1.0
		Silicon, Total	11300	UG/L	17.8	1.0
		Tin, Total	5.1 u	ng/r	5.1	1.0
		Strontium, Total	361	UG/L	0.10	1.0
	•	Thallium, Total	7.3 u	UG/L	7.3	1.0
		Oranium, Total	15.2	UG/L	13.7	1.0
		Vanadium, Total	1.2	UG/L	0.60	1.0
		Zinc, Total	1.6UT	DG/L	0.70	1.0

pe 1/3/05

### INORGANICS DATA SUMMARY REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0510L496

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
*****	**************	*************	424			***
-002	J107¥9	Silver, Total	0.80 u	UG/L	0.80	1.0
		Aluminum, Total	31.9 u	UG/L	31.9	1.0
•		Arsenic, Total	4.7 u	TG/L	4.7	1.0
		Boron, Total	44.6	DG/L	2.3	1.0
		Barium, Total	68.5	UG/L	0.10	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Bismuth, Total	6.5 u	UG/L	6.5	1.0
		Calcium, Total	69300	JG/L	7.1	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Cobalt, Total	Q.70 U	UG/L	0.70	1.0
		Chromium, Total	19.5	UG/L	0.70	1.0
	•	Copper, Total	1.3 u	UG/L	1.3	1.0
		Iron, Total	133	UG/L	26.0	1.0
		Mercury, Total	0.10 u	UG/L	0.10	1.0
		Potassium, Total	5700	UG/L	340	1.0
		Lithium, Total	4.9	UG/L	0.30	1.0
		Magnesium, Total	12600	UG/L	6.5	1.0
		Manganese, Total	1.1 UJ	UG/L	0.20	1.0
		Molybdenum, Total	1.0 u	OG/L	1.8	1.0
		Bodium, Total	21500	UG/L	17.4	1.0
		Nickel, Total	2.4	UG/L	1.3	1.0
		Phosphorus, Total	26.6 J	DG/L	8.4	1.0
		Lead, Total	2.9 u	UG/L	2.9	1.0
		Antimony, Total	3.0 u	DG/L	Q. E	1.0
		Selenium, Total	4.3 u	UG/L	4.3	1.0
		Silicon, Total	15200	UG/L	17.8	1.0
		Tin, Total	5.1 u	UG/L	5.1	1.0
		Strontium, Total	337	UG/L	0.10	1.0
		Thallium, Total	7.3 u	UG/L	7.3	1.0
		Uranium, Total	13.7 น	UG/L	13.7	1.0
		Vanadium, Total	4.2	UG/L	0.60	1.0
•		Zinc, Total	5.0	UG/L	0.70	1.0

N 1)3/05

# Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



### **Analytical Report**

Client: TNU-HANFORD RC-048

LVL#: 0510L496

**SDG/SAF#:** K0046/RC-048

W.O.#: 11343-606-001-9999-00

Date Received: 10-14-05

#### METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 water samples.

- 2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were rerun for Potassium, Sodium, and Phosphorous due to high concentrations or sample matrix.
- 3. All analyses were performed within the required holding times.
- 4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. The duplicate analyses for 7 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
- 12. For the purposes of this report, the data has been reported to the Instrument Detection Limit

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 26 pages.

- (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
- 13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

jjw/m10-496

10/27/08

Date



Washington Closu		C	HAIN OF CUS	rody/s	AMPLI	ANAL	YSIS	RE	QUEST	ľ	R	C-048-6	Page 1	of 2
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cook 4°C	- pas	15	Volume	125mL	1000mL	1000mL	10001	nl.	1000mL	1000mL	500mL	500mL	1000mL	1000mL
	SAMPLE ANALY	YSIS		Carbon-14; Tritium - 153	See item (1) in Special Instructions.	Strontium- 89,90 — Total Sr	Isotop Thorium (Thorium	232) L	Inotopic Uranium (Uranium- 233/254, Utanium-235, Uranium-238)	Radium -226 Ra-228	5; See itera (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082
Sample No.	Matrix *	Sample Date	Sample Time						14多数					
J10891	WATER	10/13/0	5 1111								X	X	Χ	X
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Collector L.O.W	AU .		any Confact AN KESSNER	Telephor 375-46					ect Coordi SNER, JH	nator	Price Code	7L		гпагоцаф/) О	1
Project Designation 100 Area and 300 Area Com	ponent of the RCBRA Water Sa	Samp	ling Location					SAF RC-0		A	Lir Quality		21	Days 🖁	)
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POSSIBLE SAMPLE HAZA	· · · · · · · · · · · · · · · · · · ·	<del></del>	]	]	T	[	T	_			]		Γ	<del> </del>	_
POTENTIAL RADIOACTIVE			Preservation	None	HNO3 to pH <2	HNO3 to pH	HINO3 to	pět i	HNO3 to pH	INO3 to pi		H2\$O4 to pH	Cool 4C	Cool 4C	
L DOT L	imits			G/P	G/P	G/P	G/I	;	G/P	<2 G/P	G/P	<2 Cool 4C	aG	•G	-
Special Handling and/or S	Storage		Type of Container	<del>                                      </del>	1	2					<u> </u>	<u> </u>	<u> </u>		_
<del>- WI</del>	- D45		No. of Container(s)		•				2	1	l l	1	3	2	
COOL 4°C	- DAS 10/13/05		Volume	125mL	1000mL	1000mL	1000₹	11L	1000mL	1000mL	500mL	500mL	1000mL	1000mL	
	SAMPLE ANALYSIS			Carbon-14; Tritism - H3	See item (1) in Special Instructions.	Strontium- 89,90 Total Sr	Isotop Thorium (Thorium	na -232∤ L	Isetopic Uranium (Uranium- 233/234, Uranium-235, Uranium-238)	Radium -226 Ra-228	; See item (2) in Special Instructions.	NO2/NO3 - 353.2	Semi-VOA - 8276A (TCL)	PC84 - 1082	
Sample No.	Matrix * Sa	nple Date	Sample Time												Ą
J107Y9	WATER 10	13/05	1209						16,1,00,00		X	X	X	X	***
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CHAIN OF POSSESSIO	DN .	Slaw/Pol-	• Name	<u> </u>											_
Relinquished By/Removed From  Relinquished By/Removed From  Relinquished By/Removed From  LABORATORY   Received By	Date/Time Rece  10/13/05/1220 S.  10/13/05/1220 S.  Rece 10/3/05/1220 S.  Rece 10/3/05/1	Sign/Primived By/Storived By/S	red in WCH Drived In Drive	ate/Time  ate/Time  ate/Time  ate/Time  ate/Time  ate/Time	(1) G Cobe Urani (2) IG Cadm Moly Tin, U	t-60, Europium um-235, Urani IP Metals - 60 ium, Calcium,	Pull List) n-152, Eur nun-238} 10 (Full L Chromun L Phosphe	(Ameri ropium- ist) (Al n, Coba orus, Po	-154, Europiu luminum, Ant alt, Copper, Ir otassium, Scie	m-155, Pota imony, Arse on, Lead, Li nium, Silico	, Beryllium-7, C ssium-40, Ruthe nic, Barium, Ber thium, Magnesia na, Silver, Sodiu	nium-106, Tho ryllium, Bismul um, Manganese m, Strontium, T	rium-234, th, Boron, :	Matrix *  5-doit  5-doit  5-doit  Si-Sindge  W = W ster  O-Oit  A-Air  D5-Orum Solid  D1-Orum Liqui  T-Timm:  WI-Wipe  L-Liquid  Y-Vegetation  X-Other	
SECTION			. <del></del>		··			<del></del>	· · · · · · · · · · · · · · · · · · ·				ent i bist		_
FINAL SAMPLE Disposal Mo	ethod .					Dispo	sed By					I	Date/Time	•	

Appendix 5

**Data Validation Supporting Documentation** 

<u>V</u> ALIDATION LEVEL:	Α :	В	С	D	E
PROJECT: R	CBRA	<u> </u>	DATA PACKAG	E: K0040	9 40
VALIDATOR:	TIT	LAB: LA	t	DATE: 12/1	6/05
			<del></del>	2046	70
	<del></del>	ANALYSES	PERFORMED		
W-846/ICP	SW-846/GFAA	6W-846/Hg	SW-846 Cyanide		
			<u> </u>		
SAMPLES/MAT	RIX				
J10.	841 7	10749			
					val,
Technical verificati	ion documentation p	oresent?			
2. INSTRUI		IANCE AND CAI	LIBRATIONS (Lev	els D and E)	1
•	<u>-</u> '				t
					Yes No N/A
	•				Yes No N/A
					Yes No N/A
Standards traceable	?		*******************************	******************************	Yes No N/A
Standards expired?		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Yes No N/A
Calculation check a	acceptable?	•••••			Yes No N/A
Comments:			<del> </del>		<del></del>

3. BLANKS (Levels B, C, D, and E)	
ICB and CCB checks performed for all applicable analyses? (Levels D,	E)
ICB and CCB results acceptable? (Levels D, E)	Yes No N/A
Laboratory blanks analyzed?	Yes No N/A
Laboratory blank results acceptable?	Yes (No) N/A
Field blanks analyzed? (Levels C, D, E)	Yes N/A
Field blank results acceptable? (Levels C, D, E)	Yes No (M)A
Transcription/calculation errors? (Levels D, E)	Yes No (NA
Comments: Lishim - 91 - 05	nrFo
Mangonese - 49 - US	
7 ine - 91 - UJ	
4. ACCURACY (Levels C, D, and E)	
MS/MSD samples analyzed?	<b>√27</b> \
MS/MSD results acceptable?	(Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No(N/A)
MS/MSD standards expired? (Levels D, E)	Yes No (N/A)
LCS/BSS samples analyzed?	
LCS/BSS results acceptable?	
Standards traceable? (Levels D, E)	Yes No NA
Standards expired? (Levels D, E)	Yes No WA
Transcription/calculation errors? (Levels D, E)	Yes No WA
Performance audit sample(s) analyzed?	· · · · · · · · · · · · · · · · · · ·
Performance audit sample results acceptable?	Yes No (N)A
Comments:	no Pts

5. PRECISION (Levels C, D, and E)							
Duplicate RPD values acceptable?	Yes (	No N/A					
Duplicate results acceptable?	Yes	(No) N/A					
MS/MSD standards NIST traceable? (Levels D, E)							
MS/MSD standards expired? (Levels D, E)	Yes	No WA					
Field duplicate RPD values acceptable?							
Field split RPD values acceptable?	Yes	No NA					
ranscription/calculation errors? (Levels D, E)							
Comments: phosphorom 27% - Jall							
		<del></del>					
6. ICP QUALITY CONTROL (Levels D and E)							
ICP serial dilution samples analyzed?	Yes	No /N/A					
ICP serial dilution %D values acceptable?	Yes	No N/A					
ICP post digestion spike required?	Yes	No N/A					
ICP post digestion spike values acceptable?		,					
Standards traceable?	Yes	Nd N/A					
Standards expired?	Yes	No N/A					
Transcription/calculation errors?	Yes	No N/A					
Comments:		$\overline{}$					
	··········						

FURNACE AA QUALITY CONTROL (Levels D and E)			
Duplicate injections performed as required?	Yes	No /	N/A
Duplicate injection %RSD values acceptable?			
Analytical spikes performed as required?			
Analytical spike recoveries acceptable?			
Standards traceable?			
Standards expired?			N/A
MSA performed as required?			N/A
MSA results acceptable?			
Transcription/calculation errors?			
Comments:		`	
<b>*</b>			
8. HOLDING TIMES (all levels)			
Samples properly preserved?		No	N/A
Sample holding times acceptable?		No No	N/A
Comments:			
<u> </u>		<del></del>	
<u> </u>			

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)	
Results reported for all requested analyses?	Yes No NA
Results reported for all requested analyses?  Rresults supported in the raw data? (Levels D, E)	Yes No NA
Samples properly prepared? (Levels D, E)	//
Detection limits meet RDL?	Ves No N/A
Transcription/calculation errors? (Levels D, E)	
Comments:	(
	<del> </del>

Appendix 6

**Additional Documentation Requested by Client** 

#### INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/21/05

CLIENT: THUHANFORD RC-048 K0046 WORK ORDER: 11343-606-601-9999-00

					reporting	DILUTION
Sample	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	PACTOR
*****	*************	20000000000000000000000000000000000000	*****			*******
BLANK1	05L0598-MB1	Silver, Total	0.20 u	UG/L	0.80	1.0
		Aluminum, Total	31.9 u	UG/L	31.9	1.0
		Arsenic, Total	4.7 u	UG/L	4.7	1.0
		Boron, Total	2.3	UG/L	2.3	1.0
	•	Barium, Total	0.10 u	UG/L	0.10	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Bismuth, Total	6.5 u	UG/L	6 - 5	1.0
		Calcium, Total	25.9	UG/L	7.1	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
	,	Cobalt, Total	. 0.70 u	UG/L	0.70	1.0
		Chromium, Total	0,70 u	UG/L	0.70	1.0
		Copper, Total	1.3 u	UG/L	1.3	1.0
		Iron, Total	26.0 u	UG/L	26.0	1.0
		Potassium, Total	340 u	UG/L	340	1.0
		Lithium, Total	0.57	UG/L	0.30	1.0
		Magnesium, Total	12.1	UG/L	6.5	1.0
		Manganese, Total	0.34	UG/L	0.20	1.0
		Molybdenum, Total	1.8 u	UG/L	1.8	1.0
		Sodium, Total	17.4 u	ng\r	17.4	1.0
		Nickel, Total	1.3 u	ng\r	1.3	1.0
		Phosphorus, Total	8.4 U	UG/L	8.4	1.0
	•	Lead, Total	2.9 u	DG/L	2,9	1.0
•		Antimony, Total	3.0 u	UG/L	3.0	1.0
		Selenium, Total	4.3 u	UG/L	4.3	1.0
		Silicon, Total	17.8 u	DG/L	17.8	1.0
		Tin, Total	5.1 u	UG/L	5.1	1.0
		Strontium, Total	0.17	UG/L	0.10	1.0
		Thallium, Total	7.3 u	ng/r	7.3	1.0
		Uranium, Total	13.7 u	UG/L	13.7	1.0
		Variadium, Total	D.60 u	UG/L	0.60	1.0
•		Zinc, Total	0.71	UG/L	0.70	1.0
BLANK1	05C0252-MB1	Mercury, Total	0.10 u	UG/L	0.10	1.0

### INORGANICS ACCURACY REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0510L496

• .							
	•	•	SPIKED	LAITINI	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	sample	result	AMOUNT	*RECOV	FACTOR (SPK)
	************	*************		****			********
-001	J10891	Silver, Total	47.6	0.80u	50.0	95.2	1.0
		Aluminum, Total	1960	31.9 u	2000	98.0	1.0
		Arsenic, Total	1920	4.7 u	2000	96.0	1.0
		Boron, Total	1000	48.3	1000	95.2	1.0
		Barium, Total	1960	42.5	2000	95.8	1.0
		Beryllium, Total	48.4	0.104	50.0	96.8	1.0
		Bismuth, Total	4710	6.5 u	5000	94.2	1.0
		Calcium, Total	101000 .	78700	25000	69.3	1.0
		Cadmium, Total	46.7	0.40u	50.0	93.4	1.0
		Cobalt, Total	470	0.704	500	93.9	1.0
	•	Chromium, Total	270	80.1	200	94.8	1.0
		Copper, Total	242	1.3 u	250	96.7	1.0
	,	Iron, Total	1170	220	1000	95.3	1.0
		Potassium, Total	28000	2700	25000	101.3	1.0
		Lithium, Total	1040	2.6	1000	103.4	. 1.0
		Magnesium, Total	34800	11400	25000	93.3	1.0
		Manganese, Total	499	9.2	500	97.9	1.0
	•	Molybdenum, Total	946	1.8 u	1000	94.6	1.0
		Sodium, Total	35500	11200	25000	97.3	1.0
		Nickel, Total	471	1.3 u	500	94.2	1.0
		Phosphorus, Total	5110	19.4	5000	101.9	1.0
		Lead, Total	475	2.9 u	800	95.0	.1.0
		Antimony, Total	480	3.0 u	500	95.9	1.0
	•	Selenium, Total	1970	4.3 u	2000	98.5	1.0
		Silicon, Total	12200	11300	1000	87.2*	1.0
		Tin, Total	95€	5.1 u	1000	95.6	1.0
		Strontium, Total	1300	361	1000	94.1	1.0
		Thallium, Total	1930	7.3 u	2000	96.4	1.0
		Uranium, Total	2380	15.2	2500	94.8	1.0
		Vanadium, Total	479	1.2	500	95.6	1.0
		Zinc, Total	477	1.6	500	95.1	1.0

#### INORGANICS ACCURACY RBPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0510L496

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	THUOMA	4RECOV	factor (SPK)
			****	****	*****	2554442	****
-003	J107¥9	Mercury, Total	1.1	0.10u	1.0	107.2	1.0

#### INORGANICS PRECISION REPORT 10/21/05

CLIENT: TNUKANFORD RC-048 K0046 WORK ORDER: 11243-606-001-9999-00 LVL LOT #: 0510L496

			INIŤIAL	-			DILUTION
SAMPLE	SITE ID	ANALYTE	result	REPLICATE	RPD		PACTOR (REP)
****	*********	************		=4225488	E=#88#0		******
-001RBP	J10891	Silver, Total	0.801	0.80u	NC		1,0
		Aluminum, Total	31.9 u	31.9 u	NC		1.0
		Arsenic, Total	4.7 u	4.7 u	NC		1.0
		Boron, Total	48.3	42.2	13.5		1.0
		Barium, Total	42.5	41.7	1.9		1.0
		Beryllium, Total	0.10u	0,10u	NC		1.0
	•	Bismuth, Total	6.5 u	6.5 u	NC		1.0
		Calcium, Total	78700	77400	1.7		1.0
		Cadmium, Total	0.40u	0.40u	NC		1.0
		Cobalt, Total	0.704	0.70u	NC		1.0
		Chromium, Total	80.1	78.7	1.6		1.0
	•	Copper Total	1.3 u	1.3 u	NC		1.0
		Iron, Total	220	217	1.6		1.0
		Potassium, Total	2700	3420	23.3		1.0
		Lithium, Total	2.6	2.1	21.3		1.0
		Magnesium, Total	11400	11300	1.3		1.0
	•	Manganese, Total	9.2	9.0	2.2		1.0
		Molybdenum, Total	1.8 4	1,8 u	NC	•	1.0
		Sodium, Total	11200	11100	0.41		1.0
		Nickel, Total	1.3 u	1.3 u	MC		1.0
		Phosphorus, Total	19.4	24.2	22.0		1.0
	•	Lead, Total	2.9 u	2.9 u	NC		1.0
		Antimony, Total	3.0 u	3.0 u.	NC	1 .	2 1.0
		Selenium, Total	4.3 u	5.0	بهنز,	and re	05 1.0
		Silicon, Total	11300	11200	1.1	Jry 10/20	1.0
		Tin, Total	5.1 u	5.1 u	NC	•	1.0
		Strontium, Total	361	356	1.4		1.0
		Thallium, Total	7.3 u	7.3 u	NC		1.0
		Uranium, Total	15.2	13.7 u	ا معد	3-40"	1.0
		Vanadium, Total	1.2	0.96	22.2	Isolo, M	ري 1.0
•		Zinc. Total	1.6	2.2	31.6	• •	1.0

#### INORGANICS PRECISION REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046

LVL LOT #: 0510L496

WORK ORDER: 11343-606-001-9999-00

			INITIAL		DILUTION
Sample	SITE ID	ANALYTE	result	REPLICATE RPD	Pactor (Rep)
*****					
-002REP	J107¥9	Mercury, Total	0.10u	0.10u NC	1-0

### INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/21/05

CLIENT: TNUHANFORD RC-048 K0046

LVL LOT #1 0510L496

		·			. "	
WORK ORD	ER: 11343-606-001-9999	-00	•			
			SPIKED	SPIKED	•	
BLIGMAR	SITE ID	ANALYTE	Sample	THUOMA	UNITS	*RECOV
	企业生业主要要要求完全企业和企业定用		*****	*#2606	CC#2#=	
LCS1	05L0598-LC1	Silver, LCS	488	500	UG/L	97.6
		Aluminum, LCS	4850	5000	UG/L	97.1
		Armenic, LCS	9550	10000	UG/L	95.5
		Boron, LCS	4810	5000	UG/L	96.2
		Barium, LCS	4800	5000	UG/L	96.1
		Bexyllium, LCS	240	250	UG/L	96.1
		Sigmuth, LCS	4820	5000	UG/L	96.3
	•	Calcium, LCS	24100	25000	UG/L	96.3
		Cadmium, LCS	239	250	UG/L	95.5
-		Cobalt, LCs	2410	2500	DG/T	96.5
		Chromium, LCS	484	500	UG/L	96.7
		Copper, LCS	1200	1250	UG/L	96.2
•	•	Iron, LCS	4820	5000	UG/L	96.4
		Potassium, LCS	24200	25000	UG/L	96.6
		Lithium, LCS	5090	5000	UG/L	101.9
		Magnesium, LCS	24000	25000	UG/L	95.8
		Manganese, LCS	742	750	UG/L	98.9
		Molybdenum, LCS	4800	5000	UG/L	95.9
		Sodium, LCS	24100	25000	UG/L	96.5
		Nickel, LCS	1910	2000	UG/L	95.5
		Phosphorus, LCS	4890	5000	UG/L	97.7
		Lead, LCS	2400	2500	UG/L	96.0
		Antimony, LCS	2890	3000	UG/L	96.2
		Selenium, LCS	9820	10000	UG/L	98.2
		Silicon, LCS	4710	6000	UG/L	94.2
,		Tin, LCS	4820	5000	UG/L	96.4
		Strontium, LCS	4850	5000	UG/L	96.9
	•	Thallium, LCS	9700	10000	UG/L	97.0
		Uranium, LCS	2360	2500	UG/L	95.4
		Vanadium, LCS	2410	2500	UG/L	96.4
		Zinc, LCS	962	1000	UG/L	96.2
LCS1	05C0252-LC2	Mercury, LCS	5.1	5.0	UG/L	101.1

Date:

3 January 2006

To:

Washington Closure Hanford (technical representative)

From:

TechLaw, Inc.

Project:

100 Area and 300 Area Component of the RCBRA Water Sampling

Subject:

Semivolatile - Data Package No. K0046-LLI

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

	enseingele Leite, e	The Marian Commen		
J10891	10/13/05	Water	С	See note 1
J107Y9	10/13/05	Water	С	See note 1

<sup>1 -</sup> Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

#### **DATA QUALITY OBJECTIVES**

### Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

#### Method Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in sample J10891 was qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

### Field Blanks

No field blanks were submitted for analysis.

### Accuracy

## Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and matrix spike duplicate recoveries outside QC limits (4% and 1%), all 4-chloroanaline results were qualified as estimates and flagged "J".

Due to matrix spike and matrix spike duplicate recoveries outside QC limits (7% and 2%), all 4-nitroanaline results were qualified as estimates and flagged "J".

Due to a matrix spike duplicate recovery outside QC limits (9%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

Due to matrix spike (0%), matrix spike duplicate (0%) and LCS (4%) recoveries outside QC limits, all 3,3-dichlorodibenzidine results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

## Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

## · Precision

## Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits (34%), all bis(2-chloroethoxy)methane results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (120%), all 4-chloroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (35%), all 2-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (35%), all 3-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (111%), all 4-nitroanaline results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (123%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (91%), all carbazole results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (65%), all di-n-octylphthalate results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (58%), all benzo(b)fluoranthene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (58%), all benzo(k)fluoranthene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (42%), all benzo(a)pyrene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (47%), all ideno(1,2,3-cd)pyrene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (53%), all dibenz(a,h)anthracene results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (41%), all benzo(g,h,i)perylene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

## Field Duplicate Samples

No field duplicates were submitted for analysis.

### · Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

### · Completeness

Data package No. K0046-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in sample J10891 was qualified as undetected, raised to the RQL and flagged "U".
- Due to matrix spike and matrix spike duplicate recoveries outside QC limits (4% and 1%), all 4-chloroanaline results were qualified as estimates and flagged "J".
- Due to matrix spike and matrix spike duplicate recoveries outside QC limits (7% and 2%), all 4-nitroanaline results were qualified as estimates and flagged "J".
- Due to a matrix spike duplicate recovery outside QC limits (9%), all nnitrosodiphenylamine results were qualified as estimates and flagged "J".

- Due to matrix spike (0%), matrix spike duplicate (0%) and LCS (4%) recoveries outside QC limits, all 3,3-dichlorodibenzidine results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (34%), all bis(2-chloroethoxy)methane results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (120%), all 4-chloroanaline results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (35%), all 2-nitroanaline results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (35%), all 3-nitroanaline results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (111%), all 4-nitroanaline results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (123%), all n-nitrosodiphenylamine results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (91%), all carbazole results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (65%), all di-n-octylphthalate results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (58%), all benzo(b)fluoranthene results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (58%), all benzo(k)fluoranthene results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (42%), all benzo(a)pyrene results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (47%), all ideno(1,2,3-cd)pyrene results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (53%), all dibenz(a,h)anthracene results were qualified as estimates and flagged "J".

• Due to an RPD outside QC limits (41%), all benzo(g,h,i)perylene results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

#### **REFERENCES**

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, 100 Area and 300 Area Component of the RCBRA Water Sampling Plan.

# Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

## SEMIVOLATILE DATA QUALIFICATION SUMMARY\*

SDG KOO46 CLASS BLAS	FLEV/EW/ERS	la Shojja cije i Jo Clary Avovo	RPAGE IL OFAD HALLE LA
THE RESERVE AND ADDRESS OF THE PERSON OF THE	MUNICE STATE		
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES	REASON
		AFFECTED	
Bis(2-ethylhexyl)phthalate	U at RQL	J10891	Blank contamination
4-chloroanaline	J	All	MS/MSD recovery
4-nitroanaline			
3,3-dichlorobenzidine	J	All	MS, MSD & LCS
L			recovery
n-nitrosodiphenylamine	J	All	MSD recovery
bis(2-chloroethoxy)methane	J	All	RPD
4-chloroanaline			
2-nitroanaline			
3-nitroanaline			
4-nitroanaline			
n-nitrosodiphenylamine	ŧ 		
carbazole			
di-n-octylphthalate			
benzo(b)fluoranthene			
benzo(k)fluoranthene	·		
benzo(a)pyrene			
dibenz(a,h)anthracene			
benzo(g,h,i)perylene			
neuzo(a'ıı'ı)hei Aiene	<u> </u>		<u> </u>

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

## Appendix 3

**Qualified Data Summary and Annotated Laboratory Reports** 

aboratory: LLI ample Number emarks ample Date xtraction Date	SDG:	<b>K0046</b> J10891		J107Y9	
emarks ample Date		_		.1107Y9	
ample Date				0.00	
xtraction Date		10/13/05		10/13/05	
		10/17/05		10/17/05	
Analysis Date		10/19/05	,	10/19/05	
emivolatile (8270C)	RQL	Result	œ		Q
henol	50	10	_	10	-
is(2-Chloroethyl)ether	50	10	U	10	_
-Chlorophenol	50	10	-	10	-
3-Dichlorobenzene	50	10		10	
4-Dichlorobenzene	50	10	U	10	U
2-Dichlorobenzene	50	10	U	10	Ü
-Methylphenol	50	10		10	
,2'-oxybis(1-chloropropane)	50	10	C	10	U
and/or 4-Methylphenol	50	10	U	10	U
-Nitroso-di-n-propylamine	50	10	U	10	U
exachloroethane	50	10	U	10	U
itrobenzene	50	10	U	10	Ų
ophorone	50	10	Ù	10	U
-Nitrophenol	50	10	U	10	U
,4-Dimethylphenol	50	10	U	10	U
is(2-Chloroethoxy)methane	50	10	IJ	10	IJ
,4-Dichlorophenol	50	10	ប	10	U_
,2,4-Trichlorobenzene	50	10	U	10	Ų
aphthalene	50	10	U	10	U
-Chloroaniline	50	10	IJ		IJ
exachlorobutadiene	50	10	J	10	U
-Chioro-3-methylphenol	50	10	U	10	U
-Methylnaphthalene	50	10	U	10	U
lexachlorocyclopentadiene	50	10	U	10	Ū
,4,6-Trichlorophenol	50	10	U	10	U
,4,5-Trichlorophenol*	50	25	J	25	U
-Chloronaphthalene	50	10	υ	· 10	U
-Nitroaniline*	50	25	UJ	25	IJ
imethylphthalate	50	10		10	
cenaphthylene	50	10		10	
,6-Dinitrotoluene	50	10	_	10	

Project: WASHINGTON CLOSUR	E HANI	FORD		]	
Laboratory: LLI		K0046		1	
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
Extraction Date		10/17/05		10/17/05	
Analysis Date		10/19/05		10/19/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q
3-Nitroaniline*	50		5	25	UJ
Acenaphthene	50	10	U	10	
2,4-Dinitrophenol*	50	25	Ü	25	υ
4-Nitrophenol*	50	25	U	25	U
Dibenzofuran	50	10	U	10	U
2,4-Dinitrotoluene	50	10		10	U
Diethylphthalate	50	10	Ü	10	U
4-Chiorophenyl-phenyl ether	50	10	υ	10	U_
Fluorene	50	10	υ	10	U
4-Nitroaniline*	50	25	UJ	25	IJ
4,6-Dinitro-2-methylphenol*	50	25		25	U
N-Nitrosodiphenylamine	50		Ü	10	IJ
4-Bromophenyl-phenyl ether	50	10		10	
Hexachlorobenzene	50	10		10	
Pentachiorophenol*	50	25	υ	25	
Phenanthrene	50	10		10	
Anthracene	50	10		10	
Carbazole	50	10			IJ
Di-n-butylphthalate	50	10		10	J
Fluoranthene	50	10		10	
Pyrene	50	10		10	
Butylbenzylphthalate	50	10		10	
3,3'-Dichlorobenzidine	50	10		10	
Benzo(a)anthracene	50	10		10	
Chrysene	50	10		10	
bis(2-Ethylhexyl)phthalate	50	50		10	_
Di-n-octylphthalate	50	10		10	
Benzo(b)fluoranthene	50	10		10	
Benzo(k)fluoranthene	50	10		10	
Benzo(a)pyrene	50	10		10	
Indeno(1,2,3-cd)pyrene	50	10	UJ	10	
Dibenz(a,h)anthracene	50	10		10	
Benzo(g,h,i)perylene	50	10	111	10	111

Report Date: 10/27/05 11:58

#### Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0	510L496	Client:		NFORD RC	_	K0046		Order: 1	.343	керогс лас 6 <b>06</b> 001	.e: 	Page: 1a	
	Cust ID:	J1089	Ĺ	<b>J108</b> 9	1	J1089	1	J107Y	)	SBLKPJ		SBLKPJ BS	3
Sample	RFW#:	003	L	001 M	3	001 MS	D	002	}	05LE0823-2	æ1	05LE0823-	-MR1
Information	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
•	D.F.:	1.0	00	1.	00	1.	00	1.0	00	1.0	10		.00
	Units:	ug/I	ن	ug/:	<b>L</b>	ug/	L	ug/I	<u>.</u>	ug/I		ug/	
N	itrobenzene-d5	57	*	66	*	65	*	61	*	50	*	68	*
Surrogate 2-1	Fluorobiphenyl	54	*	64	Ł	63	*	55	*	46	2	62	ŧ
Recovery	Terphenyl-d14	83	8	72	ł	72	8	92	ક	82	*	83	*
•	Phenol-d5	55	*	66	ક	60	ł	62	ક	55	¥	71	ę.
	2-Fluorophenol	45	₹	68	¥	63	*	63	¥	52	ž	70	*
2,4,6-9	Tribromophenol	38	<b>*</b> ==f]==:	83	*	78	*	66	*	56	ŧ	75	8
Phenol	E 医二甲基苯基甲基甲基异异异异异异异异异异异异异异异异异异异异异异异异异异异异异异异		¥≢[⊥==: U	**************************************	\$ ==[1=	***==**= 80	==	 10	=fl: U	 10	==fl U	<b></b> 81	==f1 %
bis (2-Chloroethyl) et	her	10	Ū	77	*	76	*	10	บ	10	ט	80	8
2-Chlorophenol		10	U	78	*	80	ş	10	Ū	10	Ū	82	8
1,3-Dichlorobenzene		10	Ū	61	*	61	*	10	ש	10	Ū	5 <u>8</u>	*
1,3-Dichlorobenzene 1,4-Dichlorobenzene		10	U	59	ક	60	. &	10	U	10	ū	56 57	*
1,2-Dichlorobenzene		10	Ŭ	63	*	63	*	10	U	10	U	61	8
7 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A		10	ប	82	*	79	*	. 10	Ū	10	ū	83	e E
2.2'-oxybis(1-Chlore	opropane)	10	Ų	77	g.	80	*	10	ט	10	Ū	75	ł
4-Methylphenol		10	ŭ	81	*	77	*	10	Ü	10	Ū	82	*
N-Nitroso-di-n-propy	/lamine	10	ט	79	¥	81	ŧ	10	Ü	10	U	85	*
Hexachloroethane	· · · · · · · · · · · · · · · · · · ·	10	U	57	f	59	*	10	Ū	10	IJ	52	*
Nitrobenzene		10	U	75	*	77	*	10	Ū	10	U	79	8
Isopnorone	·	10	U	82	¥	85	¥	10	Ū	10	U	89	8
2-Nitrophenol		10	บ	76	ક	79	*	10	ט	10	Ū	80	8
2,4-Dimethylphenol_		10	Ū	80	ŧ	76	*	10	℧.	10	ū	85	ę.
bis(2-Chloroethoxy)n		10	UI	55	8	39	¥	10	ָט כָ		Ū	78	8
2,4-Dichlorophenol_		10	Ū	77	४	79	*	10	υ`	10	Ū	80	₹ *
1,2,4-Trichlorobenze	ene	10	Ü	- 58	*	61	8	10	Ū	10	ū	54	ક
Naphthalene		10	U	64	*	66	ŧ	10	Ū	10	Ū	61	ž
4-Chloroaniline		10	u I	4 1	* <b>&amp;</b>	<b>1</b> '	* %	10	ם ב	10	U	26	¥
Hexachlorobutadiene_		10	ū	61	ŧ	63	*	10	U	10	U	56	*
4-Chloro-3-methylphe	enol	10	Ü	80	*	79	¥	10	Ū	10	Ü	84	ž
2-Methylnaphthalene_		10	U	68	ŧ	70	¥	10	U	10	Ū	61	ŧ
Hexachlorocyclopenta		10	ប	59	ŧ	66	*	10	U	10	Ū	37	*
2,4,6-Trichloropheno		10	Ū	80	*	84	*	10	U	10	Ū	74	*
2,4,5-Trichloropheno		25	U	82	¥	87	ት	25	U		Ū	84	ę.
*= Outside of EPA CI	LP QC limits.	-						4.4	4	12/06		<del>- "</del>	-

N 1/2/05

RFW Batch Number: 0510L496 Cust ID:	Client: TNU J10891	J1089	L	J10891	Work	J107Y9		S <b>BLK</b> PJ	Page: 1b	
RFW#:	001	001 м	3	001 MSD		002	(	05LE0823-MB1	05LE0823-	- <b>M</b> B (
2-Chloronaphthalene	10 U	73	*	78	*	10	U	10 0	68	4
2-Nitroaniline	_ 25 ປີ	<b>7</b> 73	*	51	*	25	UJ	25 บั	84	9
Dimethylphthalate		80	¥	84	*	10	Ū.	10 U	86	9
Acenaphthylene	10 U	73	*	65	8	10	U	10 U	74	ş
2,6-Dinitrotoluene		82	*	86	*	10	U	10 U	88	9
3-Nitroaniline	25 ซ	J 74	*	52	*	25	U J		16	9
		75	*	76	ક	10	<u>ั</u>	10 U	73	9
Acenaphthene 2,4-Dinitrophenol		124	* *	129 *	¥	25	Ū	25 U	66	9
4-Nitrophenol	25 U	102	*	95	8	25	Ū	25 U	83	\$
Dibenzofuran		78	*	82	ક	10	Ū	10 U	77	9
2,4-Dinitrotoluene	10 U	89	*	90	ક	•	Ū	10 U	92	\$
Diethylphthalate	10 U	80	¥	83	¥	10	Ū	10 U	89	, s
4-Chlorophenyl-phenylether		76	¥	81	ક	10	Ū	10 U	79	ş
Fluorene	_	80	<b>ት</b>	84	*	10	Ū	10 U	81	1
4-Nitroaniline	25 U.	J 7 :	* *	2 *	*	25	ū J		35	9
4,6-Dinitro-2-methylphenol		116	*	118	*	25	Ü	25 U	87	9
N-Nitrosodiphenylamine (1)		T 38	*	9 *	ક	10	ŪJ.		56	,
4-Bromophenyl-phenylether		74	<b>ት</b>	75	¥	10	U	10 U	74	•
Mexachlorobenzene	10 U	99	*	95	*	10	U	10 U	83	9
Pentachlorophenol		128	* }	127 *	*	25	Ū	25 U	96	1
-Phenanthrene	10 U	82	8	80	ł	10	Ū	10 U	84	, 1
Anthracene	_ 10 σ	84	¥	91	ક	10	U	10 U	89	9
Carbazole	ַ 10 T	J 78	8	29	*	10	T v		93	1
Carbazole Di-n-butylphthalate	10 U	84	*	85	*	10	U	1 J	91	9
Fluoranthene .	10 U	95	¥	91	f	10	Ū	10 U	89	9
Pyrene	10 U	77	ł	78	ቴ	10	U	10 U	84	9
Butylbenzylphthalate	10 U	78	*	80	¥	10	Ū	10 U	90	1
3,3'-Dichlorobenzidine	10	0	¥	0	ł	10	Ū	10 U	4	
Benzo(a) anthracene	10 U	81	¥	81	ŧ	10	Ū	10 U	88	9
Chrysene	10 FT	79	*	81	*	10	Ū	10 U	83	1
bis(2-Ethylhexyl)phthalate	50 <del>0.6.65</del>	80	*	84	*	. 10	_	0.9 J	83	
Di-n-octyl phthalate Benzo(b) fluoranthene	10່່ ື່ປ່	<b>J</b> 87		171 *			UJ		88	٦ ج
Benzo(b) fluoranthene	10 U			168 *			U	10 U		
Benzo(k)fluoranthene	10 U	1		160 *				10 U		9
Benzo(a)pyrene	10 U	l		135			- 1	10 U		
Indeno(1,2,3-cd)pyrene		E		149 *			o	10 U		
Dibenz (a,h) anthracene	10 U	ì		167 *				10 U		
Benzo(g,h,i)perylene	10 U	ł.	*		8		u ↓		81	

Report Date: 10/27/05 11:58

#### Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Client: TNUHANFORD RC-048 K0046 RFW Batch Number: 0510L496 Work Order: 11343606001 Page: 2a Cust ID: SPLKPJ BSD RFW#: 05LE0823-MB1 Sample Matrix: WATER Information 1.00 D.F.: ug/L Units: Nitrobenzene-d5 69 ¥ 2-Fluorobiphenyl Surrogate Terphenyl-d14 Recovery Phenol-d5 70 2-Fluorophenol 71 2,4,6-Tribromophenol 74 83 Phenol bis (2-Chloroethyl) ether 84 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol 89 2,2'-oxybis(1-Chloropropane) 80 4-Methylphenol 85 N-Nitroso-di-n-propylamine 89 √ Hexachloroethane 56 Nitrobenzene 79 Isophorone 90 2-Nitrophenol 81 2,4-Dimethylphenol 86 bis (2-Chloroethoxy) methane 2,4-Dichlorophenol 81 1,2,4-Trichlorobenzene Naphthalene 62 4-Chloroaniline 2 Hexachlorobutadiene 55 4-Chloro-3-methylphenol 2-Methylnaphthalene Hexachlorocyclopentadiene 42 2,4,6-Trichlorophenol 78 2,4,5-Trichlorophenol 85 \*

\*\* Outside of BPA CLP QC limits.

888888888

Cust ID: SBLKPJ BSD

RFW#: 05LE0823-MB1

(1) - Cannot be separated from Diphenylamine. \*= Outside of EPA CLP QC limits.

										 _			
	2-Chloronaphthalene	68	1	<b>t</b>									
	2-Nitroaniline	79	. 1	<b>k</b>									
	Dimethylphthalate	87	8	ŧ							•		
	Acenaphthylene	72	1	k									
	2,6-Dinitrotoluene	90	. 1	k	**			•				•	
	3-Nitroaniline	3	* 1	ř ·									
	Acenaphthene	74	4	k				•					
	2,4-Dinitrophenol	88	9	<b>t</b>									
	4-Nitrophenol	86	9	t									
	Dibenzofuran	79	4	È									
	2,4-Dinitrotoluene	93	9	k									
	Diethylphthalate	89	ş	<b>t</b>									
	4-Chlorophenyl-phenylether	79	9	ķ									
	Fluorene	80	ş	ł.									
	4-Nitroaniline	15	\$	t									
	4,6-Dinitro-2-methylphenol	98	\$	t									
	N-Nitrosodiphenylamine (1)	38	٩	k	•								
	4-Bromophenyl-phenylether	75	1	k									
٥	Hexachlorobenzene	83	٩	<b>k</b>									
$\supset$	Pentachlorophenol	105	* \$	ķ									
2	Phenanthrene	85	9	t									
₹.	Anthracene	89	9	<del> </del>									
	Carbazole	81	1	k .									
•	Di-n-butylphthalate	89	1	ķ						•			
	Fluoranthene	85	٩	k									
	Pyrene	81	5	k									
	Butylbenzylphthalate	88	ş	ŧ									
	3,3'-Dichlorobenzidine	0	5	k			-		*				
	Benzo(a)anthracene	87	1	ŧ						•			
	Chrysene	78	ş	t									
	bis(2-Ethylhexyl)phthalate	80	5	k									
	Di-n-octyl phthalate	113	1	k									
	Benzo (b) fluoranthene	116	1	8									
	Benzo(k) fluoranthene	109	\$	t									
	Benzo(a)pyrene	106	1	ŧ									
	Indeno(1,2,3-cd)pyrene	108		ķ			•						
	Dibenz(a,h)anthracene	111	\$	k							•		
	Benzo(g,h,i)perylene	101	1	t						•			
						_							

Client: TNURANFORD RC-048 K0046

Laboratory Narrative and Chain-of-Custody Documentation



#### Case Narrative

Client: TNU-HANFORD RC-048

LVL#: 0510L496

SDG/SAF # K0046/RC-048

**W.O.** #: 11343-606-001-9999-00 **Date Received:** 10-14-2005

#### **SEMIVOLATILE**

Two (2) water samples were collected on 10-13-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3520C on 10-17-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 10-19-2005.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- All results presented in this report are derived from samples that met LvLI's sample acceptance policy. 1.
- 2. Samples were extracted and analyzed within required holding time.
- Non-target compounds were detected in the samples. 3.
- All surrogate recoveries were within acceptance criteria. 4.
- 5. Fourteen (14) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
- Three (3) of one hundred twenty-eight (128) blank spike recoveries were outside acceptance criteria. A 6. copy of the Sample Discrepancy Report (SDR) has been enclosed.
- The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-7. n-butylphthalate at levels less than the CRQL. The method blank also contained the target compound Benzo (g, h, i) perylene at a level less than the CRQL.
- Internal standard area criteria were not met for sample J107Y9. The out of criteria sample was reanalyzed 8. on 10-20-2005 with similar results and will be available upon request. However, the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly.
- Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost 9. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
- LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. 10. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- I certify, that this sample data package is in compliance with SOW requirements, both technically and 11. for completeness, other than the conditions detailed above. Release of the data, contained in this hardcopy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

som\gorup\data\bna\tnu-hanford\0510-496.doc The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 2 1 pages.

000020

Lionville Laboratory	Sample Discre	oancy Report (	SDR) SDR #: USMSSIS
Initiator: SS	Batch: 05/0	i ual	Parameter: \$270
Date: In:43-ox		DOIT, 85, 850	
Client: TNU	Method: SW848		Prep Batch: OSIE OF 13
•			
1. Reason for SDR a. COC Discrepancy Tech Pro	ofile Error Client	Request Sar	npler Error on C-O-C
Transcri	otion Error Wrong	Test Code Oth	er
b. General Discrepancy Missing Sample/Extract Hold Time Exceeded	Insufficient Sample	Wrong Sam	·
Improper Bottle Type  Note*: Verified by [Log-in] or [Prep Group] (	•	sis	•
c. Problem (Include all relevant spe		if necessary)	
			4 . 4 . 4
in the BS	hitmaniline rea	cours < 10% i	n mstmsd 6850 butok
no recover of 3,3'- Dich le	no beneiding in the	ms, msd, 650-65	d
2. Known or Probable Causes(s)		<del></del>	
		the highly con	ratic chromaty raphic
behavior of	these compounds		• • • •
3. Discussion and Proposed Actio	n Other De	scription:	
Re-log Entire Batch		1	
Entire batch Following Samples:	narn	i te	
Re-leach		• **	
Re-extract Re-digest			
Revise EDD	[ ]	,	
Change Test Code to	— / <i>.</i> /		. 1
Place On/Take Off Hold (circle)	- Chief		
4. Project Manager Instructionssi	gnature/date:	My colo	
<ul> <li>Concur with Proposed Action</li> <li>Disagree with Proposed Action;</li> </ul>	See Instruction	$\mathcal{V}$	
Include in Case Narrative			
Client Contacted: Date/Person			
Add			
Cancel	_		
5. Final Actionsignature/date:	gest][analysis] (circle)	Other Explanat	ion:
✓Included in Case Narrative Hard Copy COC Revised			
Electronic COC Revised			
EDD Corrections Completed			
When Final Action has been record	led, forward original t	o QA Specialist for d	listribution and filing.
Route Distribution of Completed SD	R		of Completed SDR
X Initiator X Lab General Managec M.	Tavior	Metals:	Beegle ic: Perrone
X Project Mgr. Stone/Johnso		GC/LC:	
Data Management: Stilwe	<u> </u>	(乙) ズ MS: Ryd	chlak/Daley)
Sample Prep: Beegle/Kige	<b>:</b> [	Log-in:	
		Other:	
QA-105-A-0805	O	00021	

поворовах

Washington	Closure Hanford		HAIN OF CUST	rody/s	AMPI.	E ANAL	VSIS	REQUES'	r	R	C-048-3	Page 1	of 2
	J. WAU	Comp	any Contact N KESSNER	Telephoi 375-4	ne No.	2, 121 (122		Project Coord KESSNER, JH	inator	Price Code	7L	Data Tu	rnaround®
Project Designation	area Component of the RCBRA Wat	Samp	ine Location	373-				SAF No. RC-048		Air Quality		21	Days 🖁
	ERC-03-102	Field	Logbook No. 1592		COA BESA	PAS65	20	Method of Shir	oment			<del></del>	88
Shipped To EBERLINE SERVI		Offsit	e Property No.	1060				Bill of Lading SEE OSPC	/Aif Bill l	No.		-	!
POSSIBLE SAMPLE	E HAZARDS/REMARKS		Preservation	'Nona	HINO3 to pi	i	12003 to		HDNO3 to 1		H2SO4 to pH	Coal 4C	Cool 4C
4 DOT	Limits		Type of Container	G/P	G/P	G/P	G/P	<2 G/P	G/P	G/P	G/P	aG	IG :
Special Handling a			No. of Container(s)	1	1	. 2	1	2	1	1	1	3	2
COOL	4°C PAS 101310	5	Volume	125mL	1000ml	1000mL .	1000п	il 1000ml	1000m	L 500mL	500mL	1000mL	1000mL
	Sample analy:	SIS	,	Cirbon-14; Trition - H3	See item (1) Special Instructions	89,90 — Total	Isotopi Thorius (Thoriuss	m Uranium	Radiam -22 Ra-22#		N02/N03 - 353.2	Seni-VOA - 8270A (TCL)	PCBs - 8082
Sample No.	Matrix *	Sample Date	Sample Time										
<b>B</b> 07Y9	WATER	10/13/05	1209	ļ	ļ					X	X	X	X
002		······································		<del></del>	<u> </u>				ļ	-			:
8		· <del>-</del>		<del>                                     </del>	<del> </del>	<del></del> -		<del></del>	<del> </del>	·	<del> </del>	<del> </del>	<del> </del>
				<del> </del> -	<del>├</del>							<del> </del> -	-
CHAIN OF POS	SSESSION	Sign/Prin	Names		/ SPE	CIAL INSTR	UCTIO	NS	<u> </u>		<u> </u>		Matrix *
Relinquished By/Removed  I. WAW  Relinquished By/Removed  SOALE  Relinquished By/Removed  Relinquished By/Removed	From Date/Time  10/3 05 / 330  From Date/Time  10/4/45 09/0  From Date/Time	Received By/Stor	ed in D	ate/Time  0/13/05/1  oute/Time  agte/Time  7/09/0	(1) Cold Ura (2) Cad Moi	Gamma Spec - ( salt-60, Europium nium-235, Urauj ICP Metals - 60 lunium, Calcium,	Full List) =152, Eur um-238) 10 (Full Li Chronium 1, Phospic	(Americium-24), A opium-154, Europi ist) (Ahuzinum, Ar a, Cobalt, Copper, prus, Potassium, Se i); Mercury - 7470	um-155, Po stimony, An Iron, Lead, J Jenium, Sili	tassium 40, Ruthe Senic, Barium, Be Lithium, Magnesi	mium-106, Tie ryllium, Bismu um, Maneance	orium-234, th, Boron, c.	S-Sail SE-Sodinson SO-Solid SI-Shadge W = Water O-Oil A-Air DS-Dram Soint DL-Dram Liquid T-Tianne W -Wipe L-Liquid V-Vegstation
Relinquished By/Removed	From Date/Time	Received By/Stor		late/Time									Х-Още
Relinquished By/Removed	From Date/Time	Received By/Sto	red in D	ate/Time		· 				·		· · · · · · _	i
LABORATORY ROSECTION	eccived By			Til	ik		:				τ	Pate/Time	
FINAL SAMPLE DISPOSITION	risposal Method					Dispo	sed By					Oute/Time	

Washingto	n Closut	e Hanford		<b>C</b> 1	HAIN OF CUS	TODY/S	AMPL	E ANAL	YSIS	RI	EOUEST	r	R	C-048-6	Page 1	of 2
Collector	DUHU L D. 1			Comp	any Contact AN KESSNER	Telepho 375-4	≡e No.			Pro	piect Coordi SSNER, JH	nator	Price Code	7L	Data Tu	rnaround
Project Designation 100 Area and 300		onent of the RCBRA			ling Location	, >	_			SA	F No.	A	ir Quality	, []	21	Days 🗟
Ice Chest No. E7	2C-99	-051 AW	- 1	Field	Logibook No. 1592		COA BESA	CAS 65	212		thod of Ship	rnegt	······································	<del></del>		
Shipped To EBERLINE SER				Offsite	Property No.	A060					if of Lading/	Air Bill No	),		<del></del>	
POSSIBLE SAMI					<u> </u>	1		T	T	<u> </u>		<u> </u>	1	<u> </u>	<del></del>	1
POTENTIAL RADI	OACTIVE				Preservation	None	HNO3 to pl.	HNO3 to pH	i#NO3 to	pH.	HNO3 to pill	HNO3 to pH		H2SO4 to pH	Cool 4C	Cool 4C
L DOT	Luv	n 175				G/P	G/P	G/P	G/P	,	G/P	<i>Ģ</i> G/₽	G/P	<2 Cool 4C	aG	•G
Special Handlin	g and/er S	torage			Type of Container	<del>                                     </del>	<del> </del>	<del> </del>	<u> </u>							
-N/A-	110-	NE		į	No. of Container(s)	1	1	. 2	l		2	1	} '	١.	3	2
COOL	400	10(13)	105	!	Volume	125mL	1000mL	1000mL	. 1000g	nL	1000mL	1000mil.	500mL	500mL	1000mL	1000ml
		SAMPLE ANAI		<del> · ·</del>		Carbon-14; Tritium - H3	See item (1) Special Instructions	\$9,90 Total	trotopi Thorium (Thorium	m :	Isotopic Uranium {Uranium- 233/234, Uranium-235, Uranium-238}	Radium -226 Ra-228	See item (2) in Special Instructions.	NO2/NO3 - 353.2	Seni-VOA - 8270A (TCL)	PCBs - 8082
Sample N	o.	Matrix *	Sample	2 Date	Sample Time					鑑						
J10891		WATER	10/17	3/0	5 1111							3,000	<i>Y</i>	X	Χ	X
		<u> </u>		-		<del></del>							<del> ^-</del>			<del> </del>
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CHAIN OF P	OSSESSIO	Ň	Sign	n/Print	Names	<u></u>	SPE	CIAL INSTE	L		<u>L</u>			ł	l	Matrix *
Relinquished By/Remover Control	yed From  yed From  yed From	Date/Time Date/Time Date/Time Date/Time Date/Time	Received Received Received	By/Ston By/Ston By/Ston By/Ston	ed in MCH  ct MACH  ct in MCH  ct	Date/Time  Date/Time  Date/Time  Date/Time  Date/Time  Date/Time	(Z5) Cob Uras (2) Cad Mod Tin,	Gaerma Spec - ( nlt-60, Europian nium-235, Urani ICP Metals - 60 mium, Calchara, ybdenum, Nicke Uranium, Varan	Full List) 1-152, Euro 10 (Full Li Chromium 1, Phombio	(Ameropius ist) (# a, Col	n-154, Europiu Aluminum, Ant balt, Copper, Ir Potassium, Sek	m-155, Potas imony, Arsei on, Lead, Lic mium, Silico	isium-40, Ruthe nic, Barium, Bei Ihium Marnesia	mium-106, The ryllium, Bismu um, Manganeu m, Sirontium, T	num-234, th, Boron,	IVALUIX  E-Soil SE-Sodme cast SU-Soild SI-Sindge W = Water O=Oil A-AAir DS-Ornen Solida DL-Drenn Liquid T-Timma WieWipe L-Liquid W-Vegetation X-Other
SECTION											•			U	are, i rue	
FINAL SAMPLE DISPOSITION	Disposal Me	thod						Dispo	eed By					I	late/Time	-

**Data Validation Supporting Documentation** 

Technical verification documentation present?	VALIDATION LEVEL:	A	В	c	D	E
SDG: KOGY6  ANALYSES PERFORMED  SW-846 8260 SW-846 8270 SW-846 8270 (TCLP)  SAMPLES/MATRIX  TO STILL DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present? Yes No N/Comments:  2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS uning/performance check acceptable? Yes No N/N/Standards traceable? Yes No N/N/Standards traceable? Yes No N/N/Standards traceable? Yes No N/N/Standards expired? Yes No N/N/N/Standards expired? Yes No N/N/Standards expired? Yes No N/N/N/Standards expired? Yes No N/N/N/N/Standards expired? Yes No N/N/N/N/N/Standards expired? Yes No N/N/N/N/N/N/N/N/N/N/N/N/N/N/N/N/N/N/	PROJECT: 12	CBRA	<u></u>	DATA PACKAG	E: Kooc	t (,
ANALYSES PERFORMED  SW-846 8260  SW-846 8270  SW-846 8270  (TCLP)  SAMPLES/MATRIX  TO STILL TO TYTE  1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE  Technical verification documentation present?  Comments:  2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable?  Yes No No No No No No No No No No No No No	VALIDATOR:	TCP	LAB: LLI	_		14/05
SW-846 8260  SW-846 8260  SW-846 8270  (TCLP)  SW-8				SDG:	K0646	<u> </u>
I. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE Technical verification documentation present?			ANALYSES	PERFORMED		
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2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)  GC/MS tuning/performance check acceptable? Yes No Note that the continuing calibrations acceptable?	SAMPLES/MAT	RIX		•		
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Standards traceable? Yes No No No No No No No No No No No No No		•				1
Standards expired?						
Calculation check acceptable?						
	<del>-</del>					<b>,</b>
Comments:	Calculation check	acceptable?				Yes No N/A
COMMITTANO.	Comments:					

3. BLANKS (Levels B, C, D, and E)	
Calibration blanks analyzed? (Levels D, E)	Yes No (N/A)
Calibration blank results acceptable? (Levels D, E)	Yes No N/A
Laboratory blanks analyzed?	Yes No N/A
Laboratory blank results acceptable?	
Field/trip blanks analyzed? (Levels C, D, E)	Yeś NV N/A
Field/trip blank results acceptable? (Levels C, D, E)	
Transcription/calculation errors? (Levels D, E)	Yes No NA
Transcription/calculation errors? (Levels D, E)  Comments: his (2-chyl hexyl) phohologe - 91	Vot Ral
	nd FB
4. ACCURACY (Levels C, D, and E)	
Surrogates/system monitoring compounds analyzed?	Xes No N/A
Surrogate/system monitoring compound recoveries acceptable?	
Surrogates traceable? (Levels D, E)	Yes No N/A
Surrogates expired? (Levels D, E)	
MS/MSD samples analyzed?	Yes No N/A
MS/MSD results acceptable?	Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No (N/A)
MS/MSD standards? (Levels D, E)	Yes No WA
LCS/BSS samples analyzed?	Y S NO N/A
LCS/BSS results acceptable?	Ye N N/A
Standards traceable? (Levels D, E)	Yes No (N/A)
Standards expired? (Levels D, E)	Yes No (N/A)
Transcription/calculation errors? (Levels D, E)	Yes No WA
Performance audit sample(s) analyzed?	Yes No N/A
Performance audit sample results acceptable?	Yes No WA
Comments: MS/MSD - 4 chlorogador - Jall	
- Unitroppalme - Jall	no PAS
MSD - n-n- wrosodykey/am - Jall	
LCS - MS/MSD - 33 dichloro henzida - Ja	e/
•	

5. PRECISION (Levels C, D, and E)	
MS/MSD samples analyzed?	Yes No N/A
MS/MSD RPD values acceptable?	Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes No (N/A)
MS/MSD standards expired? (Levels D, E)	Yes Nó (N/A)
Field duplicate RPD values acceptable?	Yes No N/A
Field split RPD values acceptable?	Yes No (N/A)
Transcription/calculation errors? (Levels D, E)	Yes No ODAA
Comments: 14 RDD's 66-82	
14 RPDione	
6. SYSTEM PERFORMANCE (Levels D and E)	
Internal standards analyzed?	Yes No N/A
linternal standard areas acceptable?	Yes No N/A
Internal standard retention times acceptable?	Yes No N/A
Standards traceable?	Yes No N/A
Standards expired?	Yes No N/A
Transcription/calculation errors?	Yes No N/A
Comments:	
7. HOLDING TIMES (all levels )	
Samples properly preserved?	Yes No N/A
Sample holding times acceptable?	Yes No N/A
Comments:	

8. COMPOUND IDENTIFICATION, QUANTIT	TATION, AND DETECTION LIMITS (all		
levels)	•		E
Compound identification acceptable? (Levels D, E)	Yes	No	(AXA)
Compound quantitation acceptable? (Levels D, E)	Yes	No	M
Results reported for all requested analyses?		No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	(N/A)
Samples properly prepared? (Levels D, E)	Yes	No	
Laboratory properly identified and coded all TIC? (Levels	D, E)Yes	No	
Detection limits meet RDL?	(Yes)	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	M
Comments:			
			<del></del>
	· · · · · · · · · · · · · · · · · · ·		
9. SAMPLE CLEANUP (Levels D and E)	÷		
GPC cleanup performed?	Yes	No	NA
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?	Yes	No	N/A
GPC calibration performed?	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?	Yes	No	N/A
Check/calibration materials Expired?	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A
Comments:			$\bigcup$

Date: 23 January 2006

To: Washington Closure Hanford (technical representative)

From: TechLaw, Inc.

Project: 100 Area and 300 Area Component of the RCBRA Water Sampling

Subject: Wet Chemistry - Data Package No. K0046-LLI

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

and Samuel Call Design	i Majang levidenda	Astiviolia Vita		essa juli alekestas
J10891	10/13/05	Water	С	See note 1
J107Y9	10/13/05	Water	С	See note 1

1 - IC anions by 300.0 and nitrate/nitrite by 353.2.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

Appendix 6. Additional Documentation Requested by Client

#### DATA QUALITY PARAMETERS

#### Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within: 28 days for nitrate/nitrite, fluoride, bromide, chloride and sulfate; and 48 hours for phosphate, nitrate and nitrite.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all nitrate, nitrite and phosphate results were qualified as estimates and flagged "J".

All other holding times were acceptable.

#### Method Blanks

#### Method\_Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

#### Field (Equipment) Blank

No field blanks were submitted for analysis.

#### Accuracy

### Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 79% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 120% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

#### Precision

#### Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 20%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

#### Field Duplicate

No field duplicates were submitted for analysis.

#### Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All fluoride and nitrite results exceeded the RQL. Under the WCH statement of work, no qualification is required.

#### Completeness

Data package No. K0046-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### MAJOR DEFICIENCIES

None found.

#### MINOR DEFICIENCIES

Due to the holding time being exceeded by less than twice the limit, all nitrate, nitrite and phosphate results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an

estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All fluoride and nitrite results exceeded the RQL. Under the BHI statement of work, no qualification is required.

#### **REFERENCES**

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, 100 Area and 300 Area Component of the RCBRA Water Sampling Plan.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

**Summary of Data Qualification** 

## WET CHEMISTRY DATA QUALIFICATION SUMMARY\*

		Letro Stall Projets ACP (1987)	FACE TROOP OF A
COMMENTS:		T	<del></del>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate	J	All	Holding time
Nitrite			
Phosphate			

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON	CLOSURE	HANFORD		]	
Laboratory: Lionville La	boratory In	c.			
Case	SDG:	K0046		ļ	
Sample Number		J10891		J107Y9	
Remarks					
Sample Date		10/13/05		10/13/05	
General Chemistry	CRDL	Result	Q	Result	Q
Bromide	0.25	0.25	υ	0.25	υ
Chloride	0.1	21.3		24.8	
Fluoride	0.05	0.25	U	0.25	U
Nitrite	0.05	0.25	υJ	0.25	U.
Nitrate	0.05	37.1	J	65.4	J
Phosphate		0.25	IJ	0.25	ນມ
Sulfate	0.25	54.8		66.0	Γ
Nitrate/Nitrite	0.15	9.5		16.6	Г

#### Lionville Laboratory, Inc.

#### INORGANICS DATA SUMMARY REPORT 10/26/05

CLIENT: TNUHANFORD RC-048 K0046 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0510L496

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
procest .	************	######################################		~====	CEC.	*****
-001	J10891	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	21.3	MG/L	2.5.	10.0
	•	Fluoride by IC	0.25 น	MG/L	0.25	1.0
	•	Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	37.1 5	MG/L	2.50	10.0
		Phosphate by IC	0.25 ũ.	MG/L	0.25	1.0
	•	Sulfate by IC	54.8	MG/L	2.5	10.0
		Nitrate Nitrite	9.5	MG/L	0.20	10.0
-002	J107Y9	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	24.8	MG/L	2.5	10.0
	·	Fluoride by IC	0.25 ນ	MG/L	0.25	1.0
		Nitrite by IC	0.25 u 🤅	∫mg/l	0.25	1.0
		Nitrate by IC	65.4 J	MG/L	2.50	10.0
		Phosphate by IC	0.25 บ.	MG/L	. 0.25	1.0
	· .	Sulfate by IC	66.0	MG/L	2.5	10.0
		Nitrate Nitrite	16.6	MG/L	0.40	20.0
					•	

W 1/2/06

Laboratory Narrative and Chain-of-Custody Documentation



#### **Analytical Report**

Client: TNU-HANFORD RC-048 K0046

W.O.#: 11343-606-001-9999-00

10/31/05 Date

LVL#: 0510L496

Date Received: 10-14-05

#### INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 water samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

- 3. Sample holding times as required by the method and/or contract were met with the exception of Nitrite, Nitrate and Phosphate due to an instrument malfunction (see the sample chronology summary for analyses times for short hold samples).
- 4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. The method blanks were within the method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits.
- 7. The matrix spike recoveries for Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate and Nitrate Nitrite were within the 75-125% control limits.
- 8. The replicate analyses for Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate and Nitrate Nitrite were within the 20% Relative Percent Difference (RPD) control limit.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

njp\i10- 496

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 17 pages.

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Washington Closu	re Hanford	C	HAIN OF CUST	CODY/S	AMPL	E ANAL	YSIS	R	EQUEST		R	C-048-6	Page 1	of 2
L MIRECIAN - · · ·	WALL		MANY Contact AN KESSNER	Telepho 375-4		,			roiect Coordi ESSNER, JH	nator P	rice Code	7L		rnaround
Project Designation 100 Area and 300 Area Corr	ponent of the RCBRA W		ling Location $99-F5-6$			•			AF No. C-048	A	ir Quality		21 .	Days
Ice Chest No. ERC-9	9-051 ANI RC-03-102	- Licht	Logbook No. -1592		COA BESK	PAS 65	20	М	lethod of Ship FED EX	ment				7
Shipped To EBERLINE SERVICES (L.	KONVILLE	Offsit	e Property No.	4060					ill of Lading/	Air Bi <b>i</b> No				
POSSIBLE SAMPLE HAZ			T	T	1	1	]				]			1
POTENTIAL RADIOACTIVE	•		Preservation	None	HNO3 to pH ≪2	HNO3 to pH <2	H2NO3 (			HNO3 to pH	HNO3 to pH	H2SO4 to pH <2 Cool 4C	Cool 4C	Cool 4C
LDOT LI	m 175			G/P	G/P	G/P	G/I		G/₽	G/P	G/P	G/P	aG .	aG .
Special Handling and/or	Storage		Type of Container						<u> </u>		<u> </u>	<u> </u>		
			No. of Container(s)	1	1 1	2	1	L	2	1	1	1	3	2
COOL 4°C	- PAS	05	Volume	1,25tml.	1000mL	1000mL	1000	noL	1000mL	1000ml	500ml.	500ml.	1000mL	1000mL
	SAMPLE ANAL	YSIS	· · · · · · · · · · · · · · · · · · ·	Carbon-14; Tritium - H3	Som from (1) is Special Instructions.	Stronthme- 89,90 Total Sr	hoto Theri {Thoriun		Johopic Uranium 2) (Uranium- 233/234, Uranium-235, Uranium-218)	Radium -226; Ra-278	See item (2) in Special instructions,	NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCRe-8082
Sample No.	Matrix *	Sample Date	Sample Time						4146					
J10891 C C C C	WATER	10/13/0	5 1111								X	X	Х	X
Č							<u> </u>				<del>  -</del>	<del>                                     </del>		
Ö					<del> </del>	<u> </u>					<del> </del>			<del> </del>
<del>-</del>	<b> </b>	·		†	<del> </del>	· <del> </del>	<del>                                     </del>		<del>-  </del>		<del> </del>	<del> </del>	<del> </del>	<del> </del>
<u> </u>				<del> </del>	<del> </del>	<del> </del>	-		<del>- </del>		<del>                                     </del>	1		ļ
	331	01 - m 1		<u> </u>	<u> </u>	<u> </u>	L				<u></u>	<u> </u>		
CHAIN OF POSSESSIO		Sign/Prin		nte/Time	SPE	CIAL INSTE	UCTIO	ONS	5		_			Matrix *
L. D. W #11 / W Relinquished By/Remoyed From 4	10/13/05	S J GAL Received By/Sto	E Storle 11	0 /3 0 5	(I) Cob	ili-60, Europiun	n-152, Eu	uropi	mericium-241, A ium-154, Europiu	ntimony-125, m-155, Potas	Beryllium-7, ( sium-40, Ruth	Cesium-134, Ce enium-106, The	siom-137, orium-234,	S-Seil SE-Seiment SO-Seile
SIGHENNELL ?	01305 1330				(2)	ilum-235, Umni ICP Metals - 60	10 (Pwi I	List)	(Aleminum, Ani	imony, Arsen	ric, Barium, Be	ryllium. Bismu	th. Boron.	SI-Sinder W = West
Relinquisted By/Jegmoved From	Dute/Time 19/14/65 09/0	Reggives By/960		nte/Time	Mol	mum, Calcium, /bdemm, Nicke	Chromiu I, Phosph	arn, C horu	Cobelt, Copper, II s, Potassium, Sci Mercury - 7470	ron, Lead, Liti cuium, Silicos	hium. Magnesi	um, Magranes	2.	O=Oil A=Air DS=Drum Solids DL=Drum Liquid
Relinquished By/Removed From	Date/Time	Received By/Sto		ate/Time		•			· · · · · · · · · · · · · · · · · · ·					Y=Tiama WI=Wipe L=Liquid
Relinquished By/Removed From	Date/Time	Received By/Sto	sed in D	ate/Time					,					V=Vagatation X=Other
Relinquished By/Removed From	Date/Time	Received By/Sto	red in D	ele/Time										
LABORATORY Received B SECTION	у			Ti	tle					· · · · · · · · · · · · · · · · · · ·		1	Inte/Tique	<del></del> :
FINAL SAMPLE Disposal M DISPOSITION	lethod		····		<u></u> ,	Dispo	sed By		<del>"<u>.</u></del>			1	Date/Time	<u> </u>

Sample No.    Abstraction   Coloure Hanford   Colour COLYCODYSAMPLE ANALYSIS REQUEST   Red-48-6   For 1   Development of the Colour Analysis   Colour Configuration   Coloure Colour Col	Date/Time	Дай		Disposed By					ž.	FINAL SAMPLE Disposal Method DISPOSITION
Sample No. Creame Hantford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  DURAL PROPERTY  CHARACTER  DURAL PROPERTY  CHARACTER  CHARACTE	Лime	Date			Tidle					LABORATORY Received By SECTION
ashlagton Closiury Hanford  CHAMP COLYSIONY SAMPLE ANALYSIS REQUIEST  DEPARTMEN  DEPARTMEN  CDAM COMPANDED From Common Co						hale/Time		Received By/Stores	Dute/Time	Relimpished By/Removed From
Sample No.  Sample No.  Distantion  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  Distantion  Distantion  Charles  Charles  Distantion  Charles  Charle	X-Othe					)ate/Time		Received By/Storec	Date/Tame	Relinquished By/Romoved From
Sample No.  Sample No.  MATER  Sample No.  MATER  SINGLESSIER  CHAIN OF CUSTODY/SAMPLE ANALLYSIS REQUEST  COMMITTEE  COMM	7 T-1					)ute/Time	2	Received By/Stored	Date/Time	Relinquished By/Removed From
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST   RC-048-6	DE-01				0		Propular.			ed Box mocorrown 10
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST   RC-4486   Property No.   Company Custer   Telephone No.   Froise Coordinator   Price Code 7L	# # # # # # # # # # # # # # # # # # #					ale/Time	· 1	Received By/Sund	Date/Time	and the fall
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST   RC-0486   Commany Contact   Commany Contact   Telephone No.   Polect Coordinator   Price Coordinator	£ £	, Nitrie, Phosphate, Salfate)	de, Chloride, Fluoride, Nitrate			Ne/Time	ale 10.	Received By/Store	1013	Relinquished By Remove it 10. Wall
Simple No.    Chain of Custro Hanford   CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST   RC-448-6	Matr		NS	CIAL INSTRUCTIO	_		5	1		CHAIN OF POSSESSION
Sample No.  MATER  MEDIANES  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  Redation  Commany Contain:  Frother Coordinator  Frother Coordinator  Frother Coordinator  Protect Coordin						<b> </b>				L
Sample No.  Sample No.  Sample No.  Marite*  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  Reduction  Commany Contains  Frober Coordinator  Commany Contains  Frober Coordinator  Frober Coordinator  Frober Coordinator  Frober Coordinator  Protect Coordinator  Protect Coordinator  Protect Coordinator  Reduction  Protect Coordinator  Reduction  Protect Coordinator  Reduction  Code										D C
INTERPRETATION Closure Hanford  CHAIN OF CUSTODY/SAMPILE ANALYSIS REQUEST  COMMAN COMMENT  COMMAN COMMENT  COMMAN COMMENT  Technology  In Extended to the RCBRA Water St.  Protection  In Ext 94 - 0 S.L  ERC 03 - 10 D  In Ext 93 - 10 D  In Ext										0
ISAIngton Closure Hanford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  PURITER  COmpare Cariact  Telephone No.  Polect Coordinato  Protection  Frice Code  The Contain Telephone No.  Frice Code  The Code The Contain Telephone No.  Fried Lection  Fri										0
Ington Closure Hanford    CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST   RC-048-6   PDPARTER   Company Conlect   Telephone No.   Project Coordinator   RC-048-6   RC-048-						×	1111	<b>50/51/01</b>	WATER	J10891
Ington Closure Hanford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  COMPAND				充均			Sample Time	Sample Date	Matrix *	Sample No.
Ington Closure Hanford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  COMMAN Content  DURNIEN  LD. WALL  Sampline Location  S	·									
Ington Closure Hanford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  COmpany Conlact DURNIEN  LD WALL  COMPANY Conlact DOAN KESSNER  DOAN KESSNER  Tetenhouse Na.  Froiet Coordinator  RESUMER, JH  Price Code 7L  SAF Na.  Price Code 7L  SAF Na.  SAF Na.  SAF Na.  Price Code 7L  SAF Na.						Particide sos 1		SIS	SAMPLE ANALY	
Ington Closure Hanford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  COMMANY Contact  LD. WALL  LD. WALL  LO. WALL  COMMANY Contact  COMMANY Contact  COMMANY Contact  Telephone No.  LO. WALL  Sampling Location  AD Area Component of the RCBRA Water Sa  (COA)  ERCAL - 94 - 0 5 L  AND  ERL-1592  Field Loebook No.  Field Loebook No.  Field						1006ml	Velume	125		
Ington Closure Hanford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  COMMANY Contact  LD.WALL  LD.WALL  COMMANY Contact  Froint Coordinator  LD.WALL  COMMANY Contact  Froint Coordinator  LD.WALL  Sampline Location  Sampline Location  Sampline Location  Field Loebook No.  ECA - 99 - 051					-	۳.	No. of Container(s)	<del>1</del>		All
Ington Closure Hanford  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  DURATEN  LD. WALL  LD. WALL  LD. WALL  LD. WALL  LD. WALL  LD. WALL  Sampling Location  ACCOPA  Field Location  ERCHAN Water Sa  Prefer No.  EL-1592  Disite Property No.  ESERVICES (LONVILLE)  RC-048  Air Quality []  Method of Shipment  FED EX  FED EX  SEAMPLE HAZARDS/REMARKS  Prefer yation  Cod 4C	_				۵.	E.	Type of Container	<del>,</del>	3	Special Handling and/or Stol
ESERVICES (LONVILLE)  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  COMPANY Contact JOAN KESSNER  COMPANY Contact JOAN KESSNER  Telephone No. JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JOAN KESSNER JH RIC O48  RC 048  Air Quality  COA JEL-1592  Offisite Property No. AD 60550  Bill of Lading/Air Bill No. SEE OSPC			<u> </u>			Control	Preservation		L A	POTENTIAL RADIOACTIVE
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST   RC-048-6   Project Coordinator   Company Contact   Telephone No.   LD. WALL		No	Bill of Lading/Air Bill I SEE OSPC		0050	406		Offsite I	VILLE	Shipped To EBERLINE SERVICES (LION
TOURNIEN LD. WALL LS and 300 Area Component of the RCBRA Water Sa  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  Telephone No.  JOAN KESSNER JOAN KES			Method of Shipment FED EX	0	20x		l l	i	.051 AWD 26-03-107	ice Chesi No. ERC - 99-
hington Closure Hanford CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST RC-048-6 P DURAIEN Company Contact Telephone No. Project Coordinator LD. WALL JOAN KESSNER 375-4688 KESSNER, JH Price Code 7L	21 Day	1	SAF No. RC-048				1		ent of the RCBRA Wa	Project Designation 100 Area and 300 Area Compon
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST RC-048-6 Page 2	Data Turnaro		Project Coordinator KESSNER, JH		hone No. 5-4688	Telep 375	v Contact KESSNER	Compan		Collector L.D. WAL
,	Page 2 of 2	L	REQUEST	A	/SAMPL	YGOT	AIN OF CUS	СН	Hanford	Washington Closure

													i
Washington Closu	re Hanford	C	HAIN OF CUST	ODY/S	AMPL	E ANAL	YSIS	REQUEST	ר	R	C-048-3	Page 1	of <u>2</u>
Collector L.O.W	DAU		AN KESSNER	Telephor 375-40				Project Coordi KESSNER, JH	nator	Price Code	7L .		resround
Project Designation 100 Area and 300 Area Con	<u> </u>		iling Location					SAF No. RC-048		Air Quality		21 ]	Days
Ice Chest No. ERC-9	9-056 AND	) Field	Logbook No. -1592		COA	PAS65		Method of Shir	ment	<del></del>		<del></del>	
Shipped To EBERLINE SERVICES (1	2C-03-102		- Daniel de Ma	060		<u>, pr 2 (g</u> 2 (	<u>-L/</u>	Bill of Lading	Air Bill N	0.			-
POSSIBLE SAMPLE HAZ					<u> </u>	T	Γ''	1 BEE OSI C	l	<u> </u>	<del></del>	<u></u>	<u> </u>
POTENTIAL RADIOACTIVE	_		Preservation	'None	HNO3 to pit	HNO3 to pH	iiNO3 i	opH HMO3 topH <2.	HNO3 to pl	H H2NO3 to pH <2	H2SO4 to pH <2 Cool 4C	Coal 4C	Cool 4C
L DOT L			Type of Container	G/P	G/P	G/P	G/I	G/P	G/P	G/P	G/P	a/G	aG
Special Handling and/or	Storage	•	No. of Container(s)	1	<del>                                     </del>	. 2	ı	2	ī	1		3	2
COOL 43	C DAS 10/13/	05	Volume	125mL	1000mL	1000mL	1000	nL 1000mL	1000mL	500mL	SOOral.	1000mL	1000mL
	SAMPLE ANAL	.YSIS		Carbon-14; Tritium - H3	See Item (1) i Special Instructions	89,90 Total	Isotoj Thoriu (Thorium	um Umaium	Radius -22: Ra-22E	f; See item (2) in Special Instructions.	NO2/NO3 - 353.2	Somi-VOA - 8270A (TCL.)	PCB1 - 8082
Sample No.	Matrix *	Sample Date	Sample Time										
J107Y9	WATER	10/13/05	5 1209							×	×	X	X
O O													
00		<del></del>		ļ		·	<u> </u>						<u> </u>
<u> </u>					<u> </u>	·	<b> </b>		<u>.                                    </u>			ļ	<u> </u>
	0.4	Cl(D-)-	• No	L									
Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From	Date/Time  Date/Time  Date/Time  Date/Time  Date/Time  Date/Time	20 5/09LC/ Received By/Stg	red in UCH Day  red in Day  red in Day  red in Day  red in Day  red in Day  red in Day	ate/Time  the/Time  the/Time  the/Time  ate/Time  ate/Time	(1) Cob Uras (2) Card Mol Tin,	alt-60, Europiun nium-235, Urani ICP Metals - 60 imium, Calcium, lybdemum, Nicke	Pull List) n-152, Ev um-238} 10 (Full ) Chromiu d, Phospi	INS  (Americians-241, / repiams-154, Baropi int) (Alaminum, Asm, Cobalt, Copper, leoras, Potassium, Sec); Mercuny - 7470	um-155, Pot timony, Ars ron, Lead, L lenium, Silic	assium-40, Ruth enic, Barium, Be ithium, Magnesi	epium-106, The cyllium, Bisma um, Manganes ru, Strontium,	orium-234, ath, Boron, te, Thallium,	Matrix *  S=Soli SE-Sodiment SO-Solid SI-Shelgy W = Water O=Oil A=Alt CIS-Drum Selide DL-Drum Liquida T=Tisase W3=Wipe L=Liquid V=Vegetation X=Other
LABORATORY Received   SECTION	Ву			Tù	lle	-	, •	<del></del>	-			Date/Tiese	
FINAL SAMPLE Disposal I	Method		74,17			Dispo	sed By		<del></del>			Date/Time	<del></del>

Washington Closur	e Hanford	C	HAIN OF CUST	rody/	SAMPL	E ANAL	YSIS	REQ	UEST		R	C-048-3	Page 2	of · 2	
Collector L.DW	-		nny Contact AN KESSNER	Telepho 375-				Project KESSN	Coordinator ER, JH	Pri	ice Code	7L	Data Tu	rnaround	
Project Designation 100 Area and 300 Area Comp	ponent of the RCBRA Water S		ling Location 9-44-5			<del></del>		SAF No RC-048		Aiı	r Quality		21	Dayo	
Ice Chest No. ERC-	19-056 AND 20-03-102	Field	Logbook No.: 1592		BESK	AS 65	20	Metbod FED	of Shipment EX						
Shipped To EBERLINE SERVICES (LIC		Offsie	e Property No.	A06	0057				Lading/Air Bi DSPC	ij No.					_
POSSIBLE SAMPLE HAZA POTENTIAL RADIOACTIVE	RDS/REMARKS		Preservation	Coel 4C	Cool 4C										i I
C DOT LIN Special Handling and/or S			Type of Container	aG	P	<u> </u>						<del> </del>	<del>                                     </del>		
l week			No. of Container(s)	3	1										1
coor 4°0	10/13/01	5	Volume	1000mi.	500mL										
	SAMPLE ANALYSIS			Pesticides - aos 1	See item (1) Special Instruction	1									•
Sample No.	Matrix * S	imple Date	Sample Time												
J107Y9	WATER 10	13/05	1209	X											
8							<u> </u>	-	·	<del></del>					_
	<u> </u>			-	<del>                                     </del>		┨—						<del>                                     </del>		-
			<u> </u>		1		<del>                                     </del>					<del></del>		<del> </del>	
CHAIN OF POSSESSIO Relinquished By/Removed From A Relinquished By/Removed From A	Date/Time Res	Sign/Prin gived By/Stor eived By/Stor ED C	Allah i	ate/Time 0/3/0S/ ale/Time	7	ECIAL INSTI		•	de, Fluoride, Nitr	ste, Nita	rite, Phosphat	c, Sulfate)		Matrix *  S-\$oil SE-Sediment SO-Solid SP-Sholgs W = Water O-Oil	<u> </u>
Relinguished Byg Choved From	4105 0910	eived By/Sy	COLITION	ate/Time										A*Air D\$-Drum Solid DL=Drum (Jqs	
Relinquished By/Removed From	Date/Time Re	eived By/Sto	red (D/	ALE Time					•					T=Tiene W=Wipe L=Liquid	
Relinquished By/Removed From	Date/Time Re	cived By/Sto	red in D	ate/Time										V=Vegetalen X=Osher	1
Relinquistica By/Removed From	Date/Time Re	eived By/Sto	red in D	ato/Time											:
LABORATORY Received By SECTION	y .			. 1	'âlle	<del></del>	-		<del></del> -				Date/Time	<u> </u>	+
FINAL SAMPLE Disposal Me DISPOSITION	ethod					Dispo	sed By		<del></del>				Date/Time	<del></del> -	1

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#### Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD RC-048 K0046

DATE RECEIVED: 10/14/05

LVL LOT # :0510L495 618L/19

CLIENT ID /ANALYSIS	rar #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	
	, · <del></del>		<del></del>		<u></u>		
J10891							
BROMIDE BY IC	100	W	05LICC77	10/13/05	10/17/05	10/17/05	
BROMIDE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	
BROMIDE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	001	W	05LICB77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	001 REP	Ŵ	05LICB77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	001 MS	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	001	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	001 REP	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	001 MS	W	05LICB77	10/13/05	10/17/05	10/17/05	
NITRITE BY IC	001	W .	05LICC77	10/13/05	10/17/05	10/17/05	1236
NITRITE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	3351
NITRITE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/17/05	2353
NITRATE BY IC	001	W	05LICC77	10/13/05	10/17/05	10/17/05	1458
NITRATE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	23 77
NITRATE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/1/705	0003
PHOSPHATE BY IC	001	W.	05LICC77	10/13/05	10/17/05	10/17/05	1346
PHOSPHATE BY IC	001 REP	W	05LICC77	10/13/05	10/17/05	10/17/05	1401
PHOSPHATE BY IC	001 MS	W	05LICC77	10/13/05	10/17/05	10/17/05	1416
SULFATE BY IC	001	W	05LICB77	10/13/05	10/17/05	10/17/05	, . , .
SULFATE BY IC	001 REP	W	05LICB77	10/13/05	10/17/05	10/17/05	
SULFATE BY IC	001 MS	W	05LICB77	10/13/05	10/17/05	10/17/05	
NITRATE NITRITE	001	W	05LN3058	10/13/05	10/25/05	10/25/05	
NITRATE NITRITE	001 REP	W	05LN3058	10/13/05	10/25/05	10/25/05	•
NITRATE NITRITE	001 MS	W	05LN3058	10/13/05	10/25/05	10/25/05	
J107Y9							
BROMIDE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/17/05	
CHLORIDE BY IC	002	W	05LICB77	10/13/05	10/17/05	10/17/05	
FLUORIDE BY IC	002	W	05LICB77	10/13/05	10/17/05	10/17/05	
NITRITE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/2/1705	००३५
NITRATE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/17/05	1514
PHOSPHATE BY IC	002	W	05LICC77	10/13/05	10/17/05	10/1/705	1452
SULFATE BY IC	002		05LICB77	10/13/05	10/17/05	10/17/05	1175
NITRATE NITRITE	002	W	05LN3058	10/13/05	10/25/05	10/25/05	
				• •	• • •		

AB OC:

# Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD RC-048 K0046

DATE RECEIVED: 10/14/05 LVL LOT # :0510L496

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
	<del></del>	<del></del>				
BROMIDE BY IC	MB1	W	05LICC77	N/A	10/17/05	10/17/05
BROMIDE BY IC	MB1 BS	W	05LICC77	N/A	10/17/05	10/17/05
CHLORIDE BY IC	MB1	W	05LICB77	N/A	10/17/05	10/17/05
CHLORIDE BY IC	MB1 BS	W	05LICB77	N/A	10/17/05	10/17/05
FLUORIDE BY IC	MB1	W	05LICB77	n/a	10/17/05	10/17/05
FLUORIDE BY IC	MB1 BS	W	05LICB77	N/A	10/17/05	10/17/05
NITRITE BY IC	MB1	W	05LICC77	N/A	10/17/05	10/17/05
NITRITE BY IC	MB1 B\$	W	05LICC77	n/a	10/17/05	10/17/05
NITRATE BY IC	MBl	W	05LICC77	N/A	10/17/05	10/17/05
NITRATE BY IC	MB1 BS	W	05LICC77	N/A	10/17/05	10/17/05
PHOSPHATE BY IC	MB1	W	05LICC77	N/A	10/17/05	10/17/05
PHOSPHATE BY IC	MB1 BS	W	05LICC77	N/A	10/17/05	10/17/05
SULFATE BY IC	MB1	W	05LICB77	N/A	10/17/05	10/17/05
SULFATE BY IC	MB1 BS	W	05LICB77	n/a	10/17/05	10/17/05
NITRATE NITRITE	MB1	W	05LN3058	N/A	10/25/05	10/25/05
NITRATE NITRITE	MB1 BS	W	05LN3058	N/A	10/25/05	10/25/05

02

**Data Validation Supporting Documentation** 

# GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION	A	В		D	Е
LEVEL:					
	CBRA	т	DATA PACKAG		
VALIDATOR: 5	TUT	LAB: LLZ	·	DATE: 12/10	0/03
	·		SDG:	0046	
		ANALYSES	PERFORMED		
Anions/IC	тос	тох	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH (	NO <sub>3</sub> /NO
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATI					
7108	रा ।।	0749		· · · · · · · · · · · · · · · · · · ·	
				****	
				·	<u>.</u>
					u ater
		ETENESS AND C			
Technical verificati	on documentation p	oresent?	•	•••••	Yes (No) N/A
Comments:					
				··	
·		·			
		IANCE AND CAL	•	•	
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# GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3.	BLANKS (Levels B, C, D, and E)	
ICB a	and CCB checks performed for all applicable analyses? (Levels D, E)	Yes No V
ICB a	and CCB results acceptable? (Levels D, E)	<u>Ye</u> s No N/A
Labor	ratory blanks analyzed?	(. Yes) No N/A
Labor	ratory blank results acceptable?	Ye No N/A
Field	blanks analyzed? (Levels C, D, E)	Yes No N/A
Field	blank results acceptable? (Levels C, D, E)	Yes No (NA
Trans	cription/calculation errors? (Levels D, E)	Yes No NA
Comn	nents:	no FB
4.	ACCURACY (Levels C, D, and E)	<b>a</b>
Spike	samples analyzed?	(Yes) No N/A
Spike	recoveries acceptable?	Yes No N/A
Sike s	standards NIST traceable? (Levels D, E)	Yes N(N)
Spike	standards expired? (Levels D, E)	Yes No N/A
LCS/I	BSS samples analyzed?	Yes No N/A
LCS/I	BSS results acceptable?	Yes No N/A
Stand	ards traceable? (Levels D, E)	Yes No N/
Standa	ards expired? (Levels D, E)	Yes No WA
Trans	cription/calculation errors? (Levels D, E)	Yes No (V/A)
Perfor	rmance audit sample(s) analyzed?	Ye No N/A
Perfor	rmance audit sample results acceptable?	Yes No 14/A
Comn	nents:	No PHS

## GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRE	CISION (Levels C, D	, and E)					
Duplicate RP	D values acceptable?			• • • • • • • • • • • • • • • • • • • •	******************	(Yes )	No N/A
Duplicate res	ults acceptable?					(. Yes 1	No N/A
MS/MSD star	plicate RPD values acceptable?  plicate results acceptable?  plicate RPD values acceptable?  plicate RPD v		***************************************	Yes 1	No N/A		
MS/MSD star	ndards expired? (Level	s D, E)				Yes 1	No WA
Field duplicat	te RPD values acceptat	ole?	. , , , , , , , , , , , , , , , , , , ,			Yes 1	No (N/A)
	eld duplicate RPD values acceptable?						
				<u> </u>			
							<del></del>
		<u> </u>					
				<u> </u>	<del></del>		
6. HOI	LDING TIMES (all le	vels)				_	
	•	•	•••••	•••••		Yes	No N/A
							N/A
							9
	nitrate	/ e.	۲ ,	( )			
	nitrite	۱۲	\ ·	١,			
					<u>-</u>		
			,				

# GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)	
Results reported for all requested analyses?	Yes No N/A
Results supported in the raw data? (Levels D, E)	Yes No N/A
Samples properly prepared? (Levels D, E)	Yes No N/A
Detection limits meet RDL?	Yes No NA
Transcription/calculation errors? (Levels D, E)	/ 1
Comments: all fluorit + n tite on	

# Appendix 6

Additional Documentation Requested by Client

#### INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/26/05

CLIENT: TNURANFORD RC-048 K0046
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0510L496

		•			REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	result	UNITS	LIMIT	FACTOR
			*******		******	
BLANK10	05L1CC77-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
	•	Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	05L1CB77-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	051N3058-MB1	Nitrate Nitrite	0.0200	MG/L	0.020	1.0

#### INORGANICS ACCURACY REPORT 10/26/05

CLIENT: TNUHANFORD RC-048 K0046 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0510L496

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	Sample	RESULT	AMOUNT	*RECOV	FACTOR (SPK)
***				***=**	****		
-001	J10891	Bromide by IC	11.1	0.11	10.0	110.1	2.0
		Chloride by IC	134	21.3	100	112.3	20.0
		Fluoride by IC	11.2	0.059	10.0	111.3	2.0
		Nitrite by IC	11.1	0.25u	10.0	111.1	2.0
		Nitrate by IC	149	37.1	100	111.8	20.0
		Phosphate by IC	11.2	0.25u	10.0	112.1	2.0
		Sulfate by IC	172	54.8	100	117-1	20.0
	·	Nitrate Nitrite	21.8	9.5	12.5	97.8	25.0
BLANK10	05LICC77-MB1	Bromide by IC	4.9	0.25u	5.0	98.2	1.0
		Nitrite by IC	4.93	0.25u	.5.00	98.5	1.0
		Nitrate by IC	4.88	0.25u	5.00	97.5	1.0
		Phosphate by IC	5.4	0.25u	5.0	108.3	1.0
BLANK10	05LICB77-MB1	Chloride by IC	4.6	0.25u	5.0	91.8	1.0
		Fluoride by IC	4.8	0.25u	5.0	96.2	1.0
		Sulfate by IC	4.8	0.25u	5.0	95.4	1.0
BLANK10	051N3058-MB1	Nitrate Nitrite	0.51	0.02u	0.50	101.8	1.0

#### INORGANICS PRECISION REPORT 10/26/05

CLIENT: TNUHANFORD RC-048 K0046 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0510L496

	·		INITIAL	•		DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	FACTOR (REP)
******	************		ECHACCAN.		****	5546
-001REP	J10891	Bromide by IC	0.25u	0.25u	NC	1.0
		Chloride by IC	21.3	23.3	9.0	10.0
		Fluoride by IC	0.25u	0.25u	NC	1.0
		Nitrite by IC	0.25น	0.254	NC	1.0
		Nitrate by IC	37.1	39.7	6.7	10.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	54.8	59.B	6.6	10.0
		Nitrate Nitrite	9.5	9.6	0.73	10.0

Date:

3 January 2006

To:

Washington Closure Hanford (technical representative)

From:

TechLaw, Inc.

Project:

100 Area and 300 Area Component of the RCBRA Water Sampling

Subject: PCB/Pesticide - Data Package No. K0046-LLI

### INTRODUCTION

This memo presents the results of data validation on Data Package No. K0046-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

a Kamara Ferov.	Pesting F. Deng A		Www.inisideoism	artagada (Destre Macania)
J10891	10/13/05	Water	С	See note 1
J107y9	10/13/05	Water	С	See note 1

<sup>1 -</sup> Pesticides by 8081A and PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area and 300 Area Component of the RCBRA Water Sampling Plan (DOE/RL-2005, Rev. 0, October 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

#### DATA QUALITY OBJECTIVES

### Holding Times

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for nondetects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

#### Method Blank

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

#### Field Blanks

No field blanks were submitted for analysis.

#### · Accuracy

### Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 80% to 120%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

### Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows

have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

#### Precision

### Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

#### Field Duplicate Samples

No field duplicates were submitted for analysis.

#### Analytical Detection Levels

Reported analytical detection levels are compared against the project specific RQLs to ensure that laboratory detection levels meet the required criteria. The methoxychlor result in sample J107Y9 exceeded the RQL. Under the WCH validation statement of work, no qualification is required. All other analytes met the RQL.

#### Completeness

Data Package No. K0046 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### MINOR DEFICIENCIES

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The methoxychlor result in sample J107Y9 exceeded the RQL. Under the WCH validation statement of work, no qualification is required

#### REFERENCES

WCH, Contract #20266, Validation Statement of Work, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-2005, Rev. 0, October 2005, 100 Area and 300 Area Component of the RCBRA Water Sampling Plan.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.
   The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

### PESTCIDE/PCB DATA QUALIFICATION SUMMARY\*

SBGRIKOBAG COMMENTS:	ligavini vila 12 Magazza - San	Pacific States BRANNING	PAGE OF ORD
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS/MSD or LCS analysis

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

# Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON C			<u> </u>			
Laboratory: LLI	SDG: K					
Sample Number		J10891		J107Y9		
Remarks					_	
Sample Date		10/13/05		10/13/05		
Extraction Date	_	10/18/05		10/18/05		
Analysis Date		10/21/05		10/21/05		
PCB	RQL	Result	a	Result	Q	
Aroclor-1016	0.5	0.41		0.40		
Arocior-1221	0.5			0.40	J	
Aroclor-1232	0.5	0.41	כ	0.40	כ	
Aroclor-1242	0.5			0.40		
Aroclor-1248	0.5	0.41	υ	0.40	υ	
Aroclor-1254	0.5			0.40	Ū	
Aroclor-1260	0.5			0.40	Ū	
Sample Number		J10891		J107Y9		
Remarks						
Sample Date		10/13/05		10/13/05		
Extraction Date		10/18/05		10/18/05		
Analysis Date		10/22/05		10/22/05		
Pesticide	RQL	Result	Q		Q	
Alpha-BHC		0.051	บ	0.050	υ	
Gamma-BHC (Lindane)		0.051		0.050		
Beta-BHC		0.051	U	0.050	U	
Heptachlor		0.051		0.050		
Delta-BHC		0.051		0.050	_	
Aldrin		0.051	U	0.050	U	
Heptachlor Epoxide		0.051	_	0.050	_	
Endosulfan l		0.051		0.050		
Dieldrin		0.051	U	0.050	υ	
4,4'-DDE		0.051		0.050	_	
Endrin		0.051		0.050	U	
- 1		0.051		0.050		
Endosulfan II		0.051	lΰ	0.050		
Endosulfan II 4,4*-DDD						
		0.051		0.050	U	
4,4'-DDD			U	0.050 0.050	_	
4,4'-DDD Endosulfan Sulfate	0.05	0.051 0.051	U		U	
4,4'-DDD Endosulfan Sulfate 4,4'-DDT	0.05	0.051 0.051	U U	0.050	U	
4,4*-DDD Endosulfan Sulfate 4,4*-DDT Methoxychlor		0.051 0.051 0.051	כככ	0.050 0.050		
4,4*-DDD Endosulfan Sulfate 4,4*-DDT Methoxychlor Endrin Ketone	5	0.051 0.051 0.051 0.051 0.051 0.051	כככככ	0.050 0.050 0.050		
4,4*-DDD Endosulfan Sulfate 4,4*-DDT Methoxychlor Endrin Ketone Endrin Aldehyde	5 5	0.051 0.051 0.051 0.051	כככככ	0.050 0.050 0.050 0.050		

PCBs by GC Report Date: 10/25/05 11:47

Cust :	D: <b>J1089</b>	J10891 001 WATER 1.00 UG/L		9	J107Y9 002 MS WATER		J107Y9 002 MSD WATER		PBLKUT		PBLKUT BS	
Sample RFV Information Matr				2					05LE0825-M WATER	<b>B1</b>	05LE0825-MB WATER	
D.1 Unit				1.00 UG/L		1.00 UG/L		0	1.00 UG/L		1.00 UG/L	
Surrogate: Tetrachloro-m-xyle  Decachlorobipher		ዩ ዩ #ገ	70 69	* * ==fl==	73 69	ቴ ቴ =fl=:	<b>72</b> 69	₹ ¥ =fl	46 52	* * =f1	62 64	ቴ ዩ ==f
Aroclor-1016	0.41	. U	0.40		115	*	113	*		Ū		¥
Aroclor-1221	0.41	. U	0.40	U	0.40	U	0.40	Ū	0.40	U	0.40	IJ
Aroclor-1232	0.41	. U	0.40	Ŭ	0.40	U	0.40	Ū	0.40	U	0.40	U
Aroclor-1242	0.41	. U	0.40	Ŭ	0.40	U	0.40	U	. 0.40	U	0.40	U
Aroclor-1248	0.41	. U	0.40	U	0.40	ซ	0.40	Ū	0.40	U	0.40	U
Aroclor-1254	0.41	. ับ	- 0.40	U	0.40	U	0.40	U	0.40	U	0.40	Ū
Aroclor-1260	0.41	U	0.40	ប	111	*	114	ł	0.40	Ū	113	¥

1/2/06

The wheeles

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

Report Date: 10/24/05 11:09

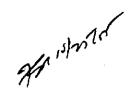
### Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Client: TNUHANFORD RC-048 K0046 Work Order: 11343606001 Page: 1 RFW Batch Number: 0510L496 PBLKUT BS J107Y9 PBLKUT J107Y9 J10891 J107Y9 Cust ID: 002 MSD 05LE0825-MB1 05LE0825-MB1 002 002 MS RPW#: 001 Sample WATER WATER WATER WATER WATER Matrix: WATER Information 1.00 1.00 1.00 1.00 1.00 1.00 D.F.: UG/L UG/L UG/L UG/L UG/L UG/L Units: 60 % 61 ¥ 52 ¥ 50 63 \* Tetrachloro-m-xylene 57 % Surrogate: 67 **a** 69 69 **%** 72 70 \* 70 Decachlorobiphenyl 0.050 U 0.050 U \* 74 0.051 U Alpha-BHC 0.050 U ¥ 0.051 U 0.050 U 77 76 gamma-BHC (Lindane) 0.050 U 76 0.051 U 0.050 U 76 74 Beta-BHC\_\_\_\_\_ 0.050 U 72 0.051 U 0.050 U Heptachlor \_\_\_\_\_\_ 0.050 U 81 Delta-BHC\_\_\_\_\_ 0.051 U 0.050 T 0.050 U 74 75 0.050 U 78 0.051 U Aldrin 0.050 U 103 0.050 U ł 105 Heptachlor epoxide\_\_\_\_\_ 0.051 U ¥ gamma-Chlordane 0.050 U 79 77 0.050 U 79 0.051 U 0.050 U 0.050 U 82 C Endosulfan I\_\_\_\_\_ 0.051 U 81 0.050 U 80 78 0.050 U 0.051 U alpha-Chlordane\_\_\_\_\_ 0.050 U 4,4'-DDE\_\_\_\_\_ 0.051 U 0.050 U 80 78 Dieldrin 80 82 0.051 U 0.050 U 81 ¥ 0.050 U 81 . 0.050 U 80 78 0.050 U Endrin 0.051 U 4,4'-DDD 79 77 80 0.051 U 0.050 U 0.050 U 0.050 U 81 80 0.050 U 84 Endosulfan II\_\_\_\_\_ 0.051 U 0.050 U 0.050 U 75 4,4'-DDT 0.051 U 0.050 U 76 Endrin aldehvde 0.051 U 0.050 U Endosulfan sulfate\_\_\_\_\_ 0.050 U 81 % 79 0.050 U 82 0.051 U Methoxychlor 0.051 U 0.050 U 77 75 \* 0.050 U 78 Endrin ketone\_\_\_\_\_ 0.051 U 0.050 U 81 79 \* 0.050 U 82 0.051 U.J 0.050 UT 0.050 U 0.051 U 0.050 U 0.050 Toxaphene \_\_\_\_\_

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

1/2/06



### Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Client: TNU-HANFORD RC-048

LVL#: 0510L496

SDG/SAF # K0046/RC-048

W.O. #: 11343-606-001-9999-00 **Date Received:** 10-14-2005

#### CHLORINATED PESTICIDES

Two (2) water samples were collected on 10-13-2005.

The samples and their associated QC samples were extracted on 10-18-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 10-22-2005. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8081A.

The following is a summary of the OC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- The required holding time for extraction and analysis was met. 2.
- The samples and their associated QC samples received a Copper-Sulfur cleanup according to 3. Lionville Laboratory SOPs based on SW846 method 3660A.
- 4. The method blank was below the reporting limits for all target compounds.
- All surrogate recoveries were within acceptance criteria. 5.
- All blank spike recoveries were within acceptance criteria. 6.
- All matrix spike recoveries were within acceptance criteria. 7.
- The initial calibrations associated with this data set were within acceptance criteria. 8.
- 9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state 10. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- I certify that this sample data package is in compliance with SOW requirements, both technically 11. and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Daniels

Laboratory Manager

Lionville Laboratory Incorporated

data. Therefore, this report should only be reproduced in its entirety of 1 2 pages.

som\r:\group\data\pest\tnu hanford\0510-496.pst The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical

000014



#### Case Narrative

Client: TNU-HANFORD RC-048

LVL#: 0510L496

SDG/SAF # K0046/RC-048

W.O. #: 11343-606-001-9999-00

Date Received: 10-14-2005

#### **PCB**

Two (2) water samples were collected on 10-13-2005.

The samples and their associated QC samples were extracted on 10-18-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 10-21-2005. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 2. Samples were extracted and analyzed within required holding time.
- 3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. The blank spike recoveries were within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- 8. The initial calibrations associated with this data set were within acceptance criteria.
- 9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- 11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

**Laboratory Manager** 

Lionville Laboratory Incorporated

som\r:\group\data\pest\tnu hanford\0510-496.pcbs

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 2 pages.

00000002

Washington Clos	sure Hanford		CHAIN OF CUST	TODY/S	AMPLI	E ANAL	YSIS	REQUES	T	R	C-048-6	Page 1	of 2
* alleribr	O. WALL		pany Contact DAN KESSNER	Telepho 375-4		· <del></del>		Protect Coord KESSNER, JH		Price Code	7L		TRAITOURIA.
Project Designation 100 Area and 300 Area C	Component of the RCBRA V		pling Location					SAF No. RC-048	_	Air Quality	, []	21	Days 🖁
Ice Chest No. ERC-	99-051 AW ERL-03-102	O Fiel	i Logbook No. L-1592		COA BESK	AS 65	Method of Shipment FED EX						988
Shipped To EBERLINE SERVICES			ite Property No.	4060	050			Bill of Ladina SEE OSPC	/Air Bill	No.			
POSSIBLE SAMPLE HA			Preservation	None	HINO3 to pH <2	HNO3 to pH	19NO3 ta	pH HNO3 to pH <2	HNO3 to	pH ENO3 to pH	H2SO4 to pH <2 Cool 4C	Cool 4C	Coel 4C
L DOT L			Type of Container	G/P	G/P	G/P	G/F		G/P		G/P	aG	яG
Special Handling and/o	or Storage	•	No. of Container(s)	1	. 1	2	ı	2	1	i	1	3	2 :
cool 40	C PAS	05	Volume	125mL	1000mL	1000mL	1000r	nL 1000mL	1000m	nl. 500mL	500mL	1000mL	1000mL
000016	sample anai	.YSIS		Carbon-14; Tritium - 113	See item (1) in Special (astructions.	Struction- 89,90 — Total Sr	Isotop Thoris (Thorism	um Uranium	Radium - Ra-22		NO2NO3 - 353,2	Semi-VOA - 8270A (TCL)	PC8u - 8082
Sample No.	Matrix *	Sample Dat	e Sample Time										
J10891	WATER	10/13/	05 1111							X	X	Χ	X
						· · · · ·							
					<u> </u>				<u> </u>				<del> </del>
CHAIN OF POSSES	SION	Sign/Pr	int Names		SPE	CIAL INSTE	UCTIC	NS					Matrix *
Relinquished By/Removed From S/OHCA/A/A/A/A/A/A/A/A/A/A/A/A/A/A/A/A/A/A/	Date/Time    Date/Time   (2)	Received By/S SJ GA Received By/S Received By/S	fored in WCH D  LE SING 19  tored in D  tored in D  tored in D  tored in D	ate/Time  0 13 0 5 ate/Time  ate/Time  ate/Time	(25) Cobs Uran (2) I Cade Moth	Samma Spec - ( lt-60, Europium lum-235, Urani CP Metala - 60 nium, Calcium, bdenum, Nicke	Fuil List) n-152, Eu um-238) 10 (Fuil L Chromius L Phosph	(Americium-241, ropium-154, Europ ist) (Aluminum, A n, Cobalt, Copper,	ium-155, P ntimony, A tron, Lead elenium, Si	125, Berylliam 7, 6 Otassium 40, Ruth Arsenic, Barium, Be Lithium, Magnesi licon, Silver, Sodia	enium-106, The cryllium, Bismu ium, Manganca	orium-234, th, Boron, e,	S-Solid SR-Section on SO-Solid SI-Sindge W = Waser O-Oil ArAir DS-Drom Solid T-Pisses WI-Wige L-Liquid V-Vegatatind X-Other
LABORATORY Received	ed By			T	ide	•					ľ	Aute/Titme	<u>*</u>
	al Method					Dispo	sed By		<del></del>	<u> </u>	1	Date/Time	<del></del>

Washington Closus	re Hanford	C	HAIN OF CUST	FODY/S	SAMPLE	ANAL	YSIS	REQUES	ST		RC-048-6	Page 2	of <u>2</u>
	WALL		any Contact AN KESSNER	Telepho 375-4				Project Cook KESSNER, J		Price Cod	ie 7L		rnarouad <sub>©</sub>
Project Designation 100 Area and 300 Area Com	ponent of the RCBRA V	Water Sa Sampl	ling Location 199-F5-4	6				SAF No. RC-048		Air Qua	lity 🗌	<b>21</b>	Days 80
Ice Chest No. ERC - 90 ERC	9-056 ANI C-03-102-	LACIS I	Logbook No. -1592	·	COA ZSESKI	45652	20	Method of Shipment FED EX					
Shipped To EBERLINE SERVICES (LIC		Official	ite Property No.  AD60050  Bill of Lading/Air Bill No. SEE OSPC										
Possible sample Haza	RDS/REMARKS	· <del></del>			T							T	1
POTENTIAL RADIOACTIVE		,	Preservation	Cool 4C	Cool 4C								
L DOT Limi		,	Type of Container	Ds	P							<del>                                     </del>	
Special Handling and/or S	_	1	No. of Container(1)	3	1 .								
COOL 4°C	DAS 10/13	3105	Volume	1000sni.	500mL	149620)							
00017	SAMPLE ANAL			Pestécides - 8061	See item (7) in Special Instructions.		,	. ,					i
Sample No.	Matrix •	Sample Date	Sample Time										
J10891	WATER	10/13/05	5 1111	,	X	Market Control	- Arcaro			High Parties	Charles Control (Control		1990年1900年12
		10110100		+	+	<del> </del>	<del> </del>		<del> </del>			+	<del> </del>
		· · · · · · · · · · · · · · · · · · ·		1	<del> </del>	<del>                                     </del>	<del>                                     </del>		+		<del></del>	<del> </del>	-
				<del>                                     </del>	<del> </del>	<del></del>	<del>                                     </del>		+			<del> </del>	+
				<del> </del>	<del></del>	<del>                                     </del>	<del>                                     </del>	<del></del>	+-			<del> </del>	+
CHAIN OF POSSESSIO	אכ	Sign/Print	.t Names	<del></del>	SPEC	IAL INSTR	i Nictr	DNS				<u> </u>	Matrix *
Relinquished By/Removed From College By/Removed From College By/Removed From Relinquished By/Removed From		Received By/Ston  Received By/Ston  Received By/Ston	realin Di	/305 Date/Time	125 3 K	1119405		uide, Chloride, Flu	oride, Nitral	e, Nitrite, Pho	sphate, Sulfate)		S-Boil SB-Sadiment SO-Solid SI-Studge W-West O-Oil A-Air
telle 10/1	14/05 0910	V-Xen	usny 10/14/00	49/8	<u>,                                    </u>								DS-Dram Salida DL-Dram Ligada
Relinquished By/Removed From	Date/Time	Received By/Ston		ate/Time									T-Times WI-Wipe L-Liquid
Relinquished By/Removed From	Date/Time	Received By/Stor	ed in D	ate/Time									V=Vojetaine X=Other
Relinquished By/Removed From	Date/Time	Received By/Stor	red in D	Pale/Time									
LABORATORY Received By SECTION	у			Ti	ide			<del>-</del>				Date/Time	:
FINAL SAMPLE Disposal Me	ethod			<del></del>	A	Dispo	osed By		•	<del></del>		Date/Time	

	9												
Washington Closus	re Hanford	CF	IAIN OF CUST	ODY/S	AMPL	E ANAL	YSIS	REQUES	Т	R	C-048-3	Page 1	of Z
Collector L.O. WAU									Project Coordinator KESSNER, JH		7L		rnaround <sub>()</sub>
Project Designation	ponent of the RCBRA Water Sa	Sampli	ing Location 9-44-5					SAF No. RC-048		Air Quality		21 1	Days 💩
Ice Chest No. ERC-90	9-056 AND C-03-102	Field L	ogbook No.		COA BESH	A565	20	Method of Shi FED EX	pment				999
Shipped To EBERLINE SERVICES (1)		+		060		7,50,50		Bill of Lading	/Air Bill	No.			<u></u>
POSSIBLE SAMPLE HAZA		1			ŀ	T :	Ţ						]
POTENTIAL RADIOACTIVE			Preservation	None	HNO3 to pH	IDNO3 to pH <2	HNO3 I	opH HNO3 topH <2	H2N03 to <2	pH HNO3 to pH. <2.	H25O4 to pH <2 Cool 4C	Cool 4C	Coal 4C
L DOT L		Ī	Type of Container	G/P	G/P	G/P	G/I	· G/P	G/P	G/P	G/P	aG	#G
Special Handling and/or S	Storage		No. of Container(s)	. 1	1	2	1	2	1	. 1	1	3	2
Cool 4º0	- DAS 10/13/05		Volume	125mL	1000mL	1000mL	1000	mL 1000mL	1000m	£. 500mL	SOOmL.	1000mL	1000mL.
00018	Sample analysis			Carbon-14; Tritken - 913	Sec item (1) i Special Instructions	Strontium 29,90 Tutal Sr	Isoto Thori (Thorian	uro Uranium	Radian - Ra-22		NOZ/NO3 - 353.1	Semi-VOA - #270A (TCL)	PC8s - 8082
Sample No.	Matrix * San	ple Date	Sample Time										
J107Y9	WATER 10	3/05	1209			_				×	×	X	X
				<u> </u>	<u> </u>								
CHAIN OF POSSESSIA	) N	Sign/Print	Names		· lene				<u> </u>		<u> </u>		Matrix *
Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From	Date/Time  Date/Time  Date/Time  Date/Time  Recei  Date/Time  Recei  Date/Time  Recei  Date/Time  Recei		ed in Dr. col in Dr. c	ate/Time  ate/Time  ate/Time  ate/Time  ate/Time  ate/Time	(1) Cob Uru (2) Cod Mol	ak-60, Europium nium-235, Urani ICP Metals - 60 mium, Calcium, lybdenum, Nicke	Full List n-152, Et um-238) 10 (Full I Chromiv st, Phospi	JPS  (Americians-241, propium-154, Europium-154, Europium-154, Europium-154, Copper, norus, Potassium, Sp.); Mercury - 747	ium-155, P ntimony, A fron, Lead elenium, Si	otassium 40, Ruth menic, Barium, Be Lithium, Magnesi	enium-106, The ryllium, Bismu um, Mangaren um, Strontium,	orium-234, sth, Boron, se,	MINITY  S-Solid  SD-Solid  SD-Solid  SD-Solid  SD-Solid  SD-Solid  N-Water  O-Oil  A-AA  OS-Drum Solids  DU-Drum Limide  T-Tiene  WI-Wipe  L-Limid  VaVegetation  X-Other
LABORATORY Received B SECTION	y			L1	uu						•	L-10 (67 & 18) (E	
FINAL SAMPLE Disposal M DISPOSITION	lethod			7		Dispo	sed By	<del> </del>		<del></del>		Date/Time	

																			!
Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS						RE	OUES?	Γ		RC	C-048-3	Page 2	of <u>1</u>	- <del>!</del>		
Collector L. DWAU			Co	Company Contact Telephone No. JOAN KESSNER 375-4688						Proie	ect Coordi SNER, JH	inator	Price Co	ode	7L		urnarou		
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa			Water Sa	Sampling Location 199-H4-5						SAF			Air Qu	ality	. 🗆	21	Days	2005	
Ice Chest No. ERC - 99-056 AND ERC - 03-(02			NP Fix	<u> </u>					Method of Shipment FED EX						9000				
Shipped To EBERLINE SERVICES (LIONVILLE)				Offsite Property No. A060050						Bill of Lading/Air Bill No. SEE OSPC						<u>@-</u>			
POSSIBLE SAMP	LE HAZA			_		Cool 4C	1	ool 4C			-						T	7	
L DOT		<i>-</i> ለፕጜ	•		Preservation	<u> </u>				<b> </b>	<del>-</del>					<u> </u>	<del></del> _		
Special Handling	_			L	Type of Container	aC		P			$\bot$					,			!
37/4	_	-	5	L	No. of Container(s)	3	<u> </u>	1 .		<u> </u>				. !	·	7	7		
COOL	4 ~	- 101	13/05		Volume	1000miL	50	00mL							-		1		: %
00019		SAMPLE ANA	LYSIS			Pesticides - SOS &	Sp	tem (1) in ipecial rections.							-				
Sample No	ð	Matrix *	Sample Da	ale	Sample Time					Z de									
J107Y9		WATER	10/13/0	05	1209	X		EMELED.	* A . T . T . T . T . T . T . T . T . T .	Bulley	SAP IMPLIES	L. C.	A Principal Prin	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	imidians y				
<del></del>					_	ļ	╀	·			_								
			<del> </del>			<del> </del>	┼			<u> </u>	_		<u> </u>					$\prod_{i=1}^{n}$	
CHAIN OF PO	OSSESSION	N .	Sign/P	Print 7	<u> </u>	<u> </u>		Tables										<del> </del>	Ì
Relinquished By/Remove	SECT.	Date/Time	Received By/	/Stored	In WEH Da	ate/Time		7	IAL INSTR Anions - 300.				u steme	estesse va		0 (54-)		Matri:	x •1
Relinquished By/Retrove	ed From . 4		Received By/			0/13/05/1 ale/Time	رص	```	· Postoria - 240.	o ference	146 <sub>1</sub> ~ am	Mari's desired	IIC, Muse,	Links' to	<b>овреж</b> «	t, Suimici		SE-Sedin SO-Solid	1
SIGNEM	de	101305 /33	OFED		<u> </u>			]						i				SI-Sledge W - Wets O-Oil	
Relinguished By/Conove	ed Paoun 10 //	Date/Time 4/05 09/0	Received By	By/Spored in Date/Time				A=Air DS=Dnum ii											
			Received By/	ed By/Stored Date/Time											DL=Orpu 7~Time W}=Wipe L=Liquid	. :			
Relinquished By/Removed From Date/Time Receiv			Received By	/Stored	.in Dai	ite/Time	he/Time				· -						•	X-Ones	
Relinquished By/Remove	ed From	Date/Time	Received By	d By/Stored In Date/Time															
LABORATORY SECTION	Received By					Ti	üle	Da					Date/Time	<u> </u>					
	Disposal Met	thod							Dispos	sed By		<del></del>		· ·			Date/Time	<del></del>	<del>;-</del> -
DISPOSITION																			

Appendix 5

**Data Validation Supporting Documentation** 

VALIDATION	_	_	/ _ }	_	
LEVEL:	A	В	C	D	E
ркојест: 2	CBRY W.	ter Same	DATA PACKAG	, , ,	
VALIDATOR:	TIF	LAB: LA	D	DATE: /2/	16/05
	<u> </u>	<u> </u>	SDG: KC	2046	
		ANALYSES I	PERFORMED		\ <del></del>
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		***************************************
SAMPLES/MAT	RIX	· · · · · · · · · · · · · · · · · · ·			
J10891	71079	79			
71-11					
				·	
		LETENESS AND C		Œ	aler
Technical verificat	ion documentation	LETENESS AND C		E	$\sim$
Technical verificat	ion documentation	present?		E	$\sim$
Technical verificat	ion documentation	present?		E	$\sim$
Technical verificat	ion documentation	present?		E	$\sim$
Technical verificat	ion documentation	present?		E	$\sim$
Technical verificat	ion documentation	present?		E	$\sim$
Technical verificat  Comments:	ion documentation  MENT PERFORM	present?	JBRATIONS (Lev	rels D and E)	Yes (No. N
Technical verificat Comments:  2. INSTRUI	MENT PERFORM	present?	LIBRATIONS (Lev	vels D and E)	Yes (No. N
Technical verificat  Comments:  INSTRUE  Initial calibrations  Continuing calibra	MENT PERFORM acceptable?	Present?	LIBRATIONS (Lev	els D and E)	Yes No N
Technical verificat  Comments:  INSTRU  Initial calibrations  Continuing calibra  Standards traceable	MENT PERFORM acceptable? tions acceptable?	AANCE AND CAL	JBRATIONS (Lev	els D and E)	Yes No N Yes No N Yes No N
2. INSTRUI Initial calibrations Continuing calibrations Standards traceable Standards expired?	MENT PERFORM acceptable?	MANCE AND CAL	LIBRATIONS (Lev	els D and E)	Yes No N Yes No N Yes No N Yes No N
2. INSTRUITIONS Continuing calibrate Standards traceable Standards expired? Calculation check	MENT PERFORM acceptable? e?	MANCE AND CAL	LIBRATIONS (Lev	els D and E)	Yes No N Yes No N Yes No N Yes No N Yes No N Yes No N

3. BLANKS (Levels B, C, D, and E)		1
Calibration blanks analyzed? (Levels D, E)	Yes	No WA
Calibration blank results acceptable? (Levels D, E)	Yes	No (N/A)
Laboratory blanks analyzed?		No N/A
Laboratory blank results acceptable?		No N/A
Field/trip blanks analyzed? (Levels C, D, E)	Yes (	Ng N/A
Field/trip blank results acceptable? (Levels C, D, E)	Yes	No WA
Transcription/calculation errors? (Levels D, E)	Yes	No (N/A
Comments:	no FB	
		<del></del>
		<del></del>
	· · · · · · · · · · · · · · · · ·	
4. ACCURACY (Levels C, D, and E)	7	
Surrogates analyzed?		No N/A
Surrogate recoveries acceptable?		
Surrogates traceable? (Levels D, E)	Yes	No N/
Surrogates expired? (Levels D, E)	Yes	No (NA
MS/MSD samples analyzed?		No N/A
MS/MSD results acceptable?		No N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No (N/A
MS/MSD standards expired? (Levels D, E)	Yes	No N/A
LCS/BSS samples analyzed?	Ves	No N/A
LCS/BSS results acceptable?	Yes	No N/A
Standards traceable? (Levels D, E)	Yes	No NA
Standards expired? (Levels D, E)	Yes	No N/
Transcription/calculation errors? (Levels D, E)		
Performance audit sample(s) analyzed?		
Performance audit sample results acceptable?	Yes	No 🕅
Performance audit sample results acceptable?  Comments: no toxople us/rso/les J	al	
		<del></del>

5.	PRECISION (Levels C, D, and E)			
Dupl	licate RPD values acceptable?	(Yes	No	N/A
Dupl	licate results acceptable?	Y	No	N/A
MS/I	MSD standards NIST traceable? (Levels D, E)	Yes	No (	NIA
MS/I	MSD standards expired? (Levels D, E)	Yes	No	
Field	duplicate RPD values acceptable?	Yes	No	KX.
Field	d split RPD values acceptable?	Yes	No	(N/A
Tran	scription/calculation errors? (Levels D, E)	Yes	No	(V)À
Com	ments:			
			<u>.</u>	
6.	SYSTEM PERFORMANCE (Levels D and E)			1
Chro	omatographic performance acceptable?	Yes	No	N/A
Posi	tive results resolved acceptably?	Yes	No	N/A
Com	nments:			
		· · · · · · · · · · · · · · · · · · ·		
		· · · · · · · · · · · · · · · · · · ·		
7.	HOLDING TIMES (all levels)			
	ples properly preserved?	N 1	No	N/A
Sam	ple holding times acceptable?		No	N/A
Com	nments:			

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DE	TECTION LIMITS (all
levels)	VX C
Compound identification acceptable? (Levels D, E)	Wes No N/A
Compound quantitation acceptable? (Levels D, E)	14 Yes No 10A
Results reported for all requested analyses?	
Results supported in the raw data? (Levels D, E)	Yes No (N/A)
Samples properly prepared? (Levels D, E)	Yes No NA
Detection limits meet RDL?	Yes NO N/A
Transcription/calculation errors? (Levels D, E)	Yes No (N/A)
Comments: metheragelor on a 91	
9. SAMPLE CLEANUP (Levels D and E)	
Fluoricil ® (or other absorbent) cleanup performed?	3.
Lot check performed?	
Check recoveries acceptable?	\$ :
GPC cleanup performed?	1 1
GPC check performed?	i f
GPC check recoveries acceptable?	1 1
GPC calibration performed?	<u> </u>
GPC calibration check performed?	<i>)</i> [
GPC calibration check retention times acceptable?	Yes No N/A
Check/calibration materials traceable?	Yes No N/A
Check/calibration materials Expired?	Yes No N/A
Analytical batch QC given similar cleanup?	Yes No N/A
Transcription/Calculation Errors?	Yes No N/A
Comments:	
	· <del>- · · · · · · · · · · · · · · · · · ·</del>